WHITESBOG VILLAGE & CRANBERRY BOG
Whitesbog Road
Pemberton Township
Burlington County
New Jersey

HALS NJ-1
NJ-1

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN LANDSCAPES SURVEY
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

HISTORIC AMERICAN LANDSCAPES SURVEY

WHITESBOG VILLAGE AND CRANBERRY BOG

HALS No. NJ-1

Location: Pemberton Township, Burlington County, New Jersey
Manchester & Plumsted Townships, Ocean County, New Jersey

Present Owner: Leased to the Whitesbog Preservation Trust by New Jersey Department of Environmental Protection

Present Occupant: Whitesbog Preservation Trust and its tenants including J.J. White Inc., the P.I.N.E.S. educational program, and The Nature Conservancy

Present Use: State Park with residential and educational use of remaining buildings. Some bogs still in production by J.J. White Inc.

Significance: Whitesbog Village and Cranberry Bog is an agricultural company town founded by J.J. White in the Pine Barrens region of central New Jersey. Whitesbog began as wild cranberry bogs converted to commercial production by James Fenwick in the 1850s. J. J. White married Mary Fenwick in 1869 and began managing these bogs after his father-in-law's death in 1882. Known for his 1870 manual *Cranberry Culture* and as a skilled machinist, J.J. White proceeded to expand and improve the family cranberry bogs over the next forty years. When incorporated under J.J. White Inc. in 1912, Whitesbog was the largest and most progressive cranberry farm in New Jersey. By the 1920s, Whitesbog included extensive cranberry bogs and irrigation systems, fields of experimental blueberry bushes and greenhouses, two groupings of migrant worker housing (Rome and Florence), and a main village including worker housing, a general store, barrel-making factory, barrel warehouse, a massive cranberry sorting and packing plant, and other associated outbuildings and structures.

J. J. White's eldest daughter, Elizabeth C. White (1871-1954), assisted her father at the bogs starting in 1893. After nearly thirty years working at Whitesbog, Elizabeth White built a house there in 1922-1923. Until her death in 1954, she lived in Suningive and experimented with native Pine Barren plants in the landscape around her house. Blueberry production was Elizabeth White's main contribution to agriculture at Whitesbog. In 1911, she proposed the ground-breaking cooperation between Whitesbog and the U.S. Department of Agriculture to create a domesticated blueberry plant. Wild blueberries grow naturally in the Pine Barrens, but the quality of their berries are inconsistent. Elizabeth White worked with U.S.D.A. scientist Frederick Coville to apply his research to the practical problem of

propagating a reliable and lucrative new cash crop plant. Blueberry production utilized land unsuitable for cranberry bogs and expanded the harvest season and crop diversity at Whitesbog. Elizabeth White also experimented with other native plants, particularly working to establish new varieties of American holly for commercial use.

Whitesbog remained a family-owned cranberry and blueberry farm until 1968 when it became part of Lebanon State Forest. Nearby modern bogs and some of the original Whitesbog property are still farmed by J. J. White Inc. and the Darlington family, descendants of J. J. White. The non-profit Whitesbog Preservation Trust was formed in 1982 to help maintain and utilize historic Whitesbog Village in cooperation with Lebanon State Forest.

Historian: Lisa Pfueller Davidson

Project Information: Whitesbog Village and Cranberry Bog was documented by the Historic American Buildings Survey (HABS) (U.S. Department of the Interior, National Park Service, HABS/HAER/HALS Division, E. Blaine Cliver, Chief), as a pilot project for the Historic American Landscapes Survey (HALS). This documentation was done through the cooperation of the Whitesbog Preservation Trust, Lebanon State Forest (New Jersey Department of Environmental Protection, Division of Parks and Forestry), and HABS (Paul Dolinsky, Chief). Catherine Lavoie, HABS Historian, and Robert Arzola, HABS Architect, served as project leaders. Lisa Pfueller Davidson served as project historian. Joe Elliott, contract photographer, completed large format photographs during summer 2000. See related documentation, HALS No. NJ-1-A, Whitesbog Village and Cranberry Bog, Suningive House and Garden for more detailed information about Elizabeth White's house and garden. Architectural and site plan fieldwork for Suningive was done by Naomi Hernandez and Raul Vazquez, HABS Architects, and Lisa Pfueller Davidson, HABS Historian, during spring 2001. Naomi Hernandez produced measured drawings and site plans. Bill Bolger, NPS Historian, Shaun Eyring and Cari Goetcheus, NPS Landscape Architects, Chris Bethmann, Superintendent I, Lebanon State Forest, Susan Goldstein, Whitesbog Preservation Trust staff, the staff of The Nature Conservancy Pine Barrens office and June Vail all greatly facilitated the completion of this project.

Introduction

Whitesbog is an agricultural site and company town located almost exactly at the center of New Jersey on the northwestern edge of the Pine Barrens National Reserve and Lebanon State Forest. The sandy, acidic soil of the Pine Barrens, part of the Outer Coastal plain deposited by ancient flooding, created unusual opportunities for industry and agriculture. An earlier period of industrial development in bog iron and glassmaking waned after the Civil War. Unique agricultural industries based on native plants such as cranberries, huckleberries, sphagnum moss, and cedar trees underpinned the regional economy starting in the mid-nineteenth century. The White family, particularly J. J. White (1846-1924) and daughter Elizabeth White (1871-1954), were instrumental in establishing the cranberry and blueberry industries that shaped this region in the late nineteenth and early twentieth centuries.

At Whitesbog the irrigation reservoirs and canals, bogs of low-growing cranberry vines surrounded by gravel roads, rows of blueberry bushes, and structures with weathered gray cedar siding create a picturesque scene. However, this is also a heavily engineered landscape created to support the agricultural and social lives of J. J. White's family and their workers. Looking at the development and cultural significance of this landscape reveals both an important aspect of New Jersey history and a nationally important story of the blending of scientific ingenuity and nature. Although the landscape of Whitesbog includes gardens and natural areas, most notably Elizabeth White's garden of native plants around her house, Suningive, it is culturally and historically significant not for its formal beauty, but the vernacular blending of working farm, residential structures, and native plants. The landscape of Whitesbog illustrates both the process of cranberry and blueberry agriculture as well as the human use and development of the land over time.

Although considered a "barren," desert-like environment because inhospitable to traditional agriculture, the Pine Barrens have a high natural water table and an abundance of native plant and animal species. Wild cranberries (*Vaccinium macrocarpon*) grew productively without special care or irrigation in the sandy soil. Native Americans utilized the wild cranberry for both food and medicinal purposes, and introduced the fruit to the first European settlers of coastal Massachusetts and New Jersey. Cranberries were especially useful in treating scurvy, and their autumn harvest time and long shelf life made them a valuable winter food source. Wild cranberry harvesting was an annual event for the residents of the New Jersey Pine Barrens.[1]

In the late eighteenth and early nineteenth centuries heavy industry, not agriculture, was the cornerstone of the Pine Barrens economy. Hanover Furnace in Burlington County was one of several flourishing centers of bog iron production. Bog iron was made by smelting the deposits

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[1]On the early history of cranberries see Paul Eck. *The American Cranberry*. (New Brunswick and London: Rutgers University Press, 1990), 1-4; and Angus Kress Gillespie. "Cranberries," in *Rooted in America: Foodlore of Popular Fruits and Vegetables*. David Scofield Wilson and Angus Kress Gillespie, eds. (Knoxville: University of Tennessee Press, 1999), 60-87.

of iron ore found in the mineral rich waters of the Pine Barrens. The fuel source for the furnace was charcoal made from the abundant supply of pine trees and other timber, a method superseded in the mid-nineteenth century by Pennsylvania blast furnaces fueled by anthracite coal. This early industrial use shaped the agricultural landscape of Whitesbog and the growing cranberry industry.

Early Cranberry Industry in New Jersey

According to Paul Eck in *The American Cranberry*, the first cultivated cranberry bog was built by Henry Hall on Cape Cod in 1810. The first cranberry bog in New Jersey was built by Benjamin Thomas of Pemberton in 1835. By the 1840s cranberry cultivation was growing rapidly in both New Jersey and New England, driven by the high price for cranberries. By the post-Civil War period New Jersey had the largest cranberry production of any state in the country.[2]

The earliest commercial bogs in the Whitesbog area were formed from naturally-occurring wild cranberry bogs during this period, in an effort to replace the waning iron industry with agricultural pursuits. In 1857 Colonel James A. Fenwick purchased 108 acres of wild cranberry bogs and pine forest along Cranberry Run south of Hanover Furnace, in what is now Whitesbog His farm seven miles west in New Lisbon was just within the fertile farmland of the Inner Coastal Plain, but this new parcel offered land naturally suited to cranberry production. He put a fence around the wild cranberry bogs on his land, much to the dismay of the local residents accustomed to the communal gathering of wild cranberries. Fenwick began to expand the natural bogs into a commercially cultivated crop, but dry weather the first several years accentuated the need for a larger irrigation water supply than provided by Cranberry Run, especially if Fenwick was to enlarge his operation. In 1879 Fenwick purchased an adjacent 490-acre tract from a Mr. Upton. This new property included a former canal and canal pond for Hanover Furnace, and Pole Bridge Branch, a more substantial stream than Cranberry Run.[3]

Another important early figure in the creation of Whitesbog was Barclay White, the first of the White family to enter cranberry agriculture. Born in Philadelphia in 1821 to a Quaker family, Barclay White began farming in Burlington County in 1842. He started cultivating cranberries in 1851, creating one of the first cranberry bogs in Burlington County. He had four sons, Howard, Joseph, George, and Barclay. The second son, Joseph Josiah, or J. J., White would develop Whitesbog as one of the largest and most progressive cranberry bogs in New

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[2]Eck, *The American Cranberry*, 4-5. The first cranberry bogs in Wisconsin were built in 1853, and in the Pacific Northwest in Washington State during 1883.

[3]An extensive report on Whitesbog sponsored by the New Jersey Conservation Foundation in 1982 refers to Hanover Furnace and Whitesbog as "sister settlements" sharing a common landscape and local labor force albeit in different periods of the nineteenth century. See William Bolger, Herbert J. Githens, and Edward S. Rutsch. *Historic Architectural Survey and Preservation Planning Project for the Village of Whitesbog*. (Morristown, N.J.: New Jersey Conservation Foundation, September 1982), esp. 10-18.

Jersey. J. J. White recalled living on his father's farm near Jobstown as a boy and traveling to the family cranberry bogs near the Wading River, twenty-five miles away in the southern part of Burlington County. White's uncle Restore B. Lamb also planted seven acres of cranberries on his Rake Pond tract near New Lisbon around 1860, and earned approximately $4,000 from his crop, a substantial sum at the time from a relatively small piece of cultivated land. J.J. and his brothers had each been given a 100-acre tract of land near Rake Pond by their grandfather, Restore S. Lamb of Mount Holly, New Jersey. J.J. was fourteen at the time, and later discovered that thirty acres of his parcel was suitable for cranberry cultivation. He began building bogs by hiring turfers to scalp the land and build turf fences in 1866.[4]

During the 1860s, the high price of cranberries inspired land speculation and the establishment of bogs throughout the New Jersey pines. The coming of the Camden and Atlantic, and West Jersey Railroads facilitated the shipment of cranberries to Philadelphia, further expanding the industry. By 1869, New Jersey bogs supplied over one half of the cranberries consumed nationally. These bogs were mainly located in Burlington, Ocean and Atlantic counties.[5]

While working on his Rake Pond bogs, J. J. White met Mary Fenwick, James Fenwick's daughter. They married in November 1869. During that winter the young couple produced the book *Cranberry Culture*, a manual on cranberry growing that was the standard informational text in the industry for many years. J. J. wrote the text and Mary produced the line drawing illustrations. Described on the title page as "a practical grower," J. J. White offered detailed information on building and maintaining cranberry bogs. Examining the advice in *Cranberry Culture* provides insight into nineteenth century cranberry cultivation methods and J. J. White's rising prominence. Adapting the natural features of the Pine Barrens' landscape was especially key to the unique requirements of the cranberry. On choosing a site to establish a cranberry bog he gives specific recommendations for assessing the soil conditions, a key factor in success:

> The soil best adapted to the production of cranberries is an *equal mixture of coarse sand and muck* (emphasis original), which is most certain to be obtained by covering well-decomposed muck with beach sand, the latter leaving a clean surface for the young plants; while in a few years the two become thoroughly incorporated, making, as it were, a soil of black sand. Could a soil of this composition be found in a state of nature, rightly situated as regards moisture,

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[4]Joseph J. White. "Cranberry Culture" (15 October 1914), typescript in Whitesbog Preservation Trust collection.

[5]Joseph J. White. *Cranberry Culture*. (New York: Orange Judd and Company, 1870), 22-24; Kimberly R. Sebold. *From Marsh to Farm: The Landscape Transformation of Coastal New Jersey*. (Washington, D.C.: Historic American Buildings Survey/Historic American Engineering Record, U.S. Department of the Interior, 1992), 69-70.

much expense of sanding might be saved.[6]

By plowing land with the desirable natural mixture of sand and muck, such as large sections of the Pine Barrens, productive cranberry bogs could be created. The natural moisture of a site was as crucial as the soil composition:

> The cranberry requires moisture always near the surface of the soil, but it is necessary that it circulate freely through the ground; as *stagnant water is fatal* to the growth of the plant....On true "Cranberry ground," although the ditches may be cut one or two feet deep, the soil rarely becomes dry more than half an inch below the surface, and this is as it should be. Water is essential, but *it must be under control*.[7]

The control of water to maintain soil conditions, irrigate, and protect the vines during the winter was the major challenge of the cranberry industry. Only through effective water control reshaping the natural landscape was White able to create his large expanse of cranberry bogs.

After choosing a location, the first step in constructing a cranberry bog was preparing the ground for planting. This process usually involving "turfing" or "scalping" the ground which required cutting away the turf and surface roots from the soil beneath and removing it in approximately twelve-inch squares (Figure 1). After removing the turf, and any remaining stumps and roots, additional drainage ditches were cut systematically through the field at regular intervals Sand was then spread over the exposed muck at a thickness dependant on the depth of the muck (Figure 2).[8]

After choosing varieties of cranberry vines which produce berries of good size and a deep red color, White recommended that they be planted in hills or rows nearly parallel to the ground to encourage runners that spread the vines. White noted that women usually performed the work of planting cranberry vines and earned an average of 75 cents a day (Figure 3).[9] Then, according to White, "after the vines are properly set out, the next consideration is to get them matted over the ground as quickly as possible, in order that they may yield a full crop, and reward the grower for the labor and care bestowed upon them."[10] Weeding and proper drainage were critical during the first years of a cranberry bog. White mentions that James Fenwick was able to improve his

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[6]White, *Cranberry Culture*, 29.

[7]White, *Cranberry Culture*, 34.

[8]White, *Cranberry Culture*, 35-41.

[9]White, *Cranberry Culture*, 50-56.

[10]White, *Cranberry Culture*, 57.

wild bogs with a minimal investment in trenching and sanding to improve overall drainage.[11]

Flooding cranberry bogs was another important step in their management, and perhaps the greatest engineering challenge to the grower. Flooding was recommended after the third year of growth to protect the vines from winter cold, destroy insects and their eggs, and provide a top dressing of fertilizer from the particles of vegetable matter in the water. Bogs were drained after danger of frost had passed in the spring. White cautioned that a substantial dam was needed at the lower end of the bog to contain the water:

> Turf fences or muck will not answer the purpose; the only dam for a cranberry meadow that may be depended upon, is one constructed of clean sand, free from roots, or pieces of turf, and built upon the solid sand or loam, as the case may be....The object of having turf on each side is not to hold water, but to economize the sand by supporting it just where it is needed, and also to protect the dam from the rippling water, which otherwise would undermine and wash it down.[12]

Floodgates constructed of a long-lasting wood such as cedar were recommended to regulate water depth at larger dams. These simple gates involved grooved planks set horizontally across the dam opening. Adapted natural bogs were several feet out of level, and so required a great deal of water to completely cover the whole bog.[13]

In *Cranberry Culture* White also addressed insects and other problems that could damage a cranberry crop. He recounts his father-in-law James Fenwick's advice on preventing the hatching of fruit worms which could decimate a crop:

> I have observed natural patches, a rod or two wide, sloping to a stream, where, next the stream, not a berry would be injured, while on the dryer part three-fourths were destroyed - this destruction reaching nearer the stream in proportion as the season was dry or wet. It is natural to infer that the egg is laid in the berry; and on the moist land the temperature is not sufficiently high to hatch it, while on dry ground it is.[14]

Strategic flooding of the bog could also exterminate vine worms (also called "fire worms"), grasshoppers, and crickets. In addition flooding prevented frost damage. After picking in the fall the bogs would be flooded, and the water left on the bogs until hopefully the danger of late spring

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[11]White, *Cranberry Culture*, 62.

[12]White, *Cranberry Culture*, 67-68.

[13]White, *Cranberry Culture*, 68-69.

[14]White, *Cranberry Culture*, 73.

frost had passed. Timing was critical because leaving the water on the bogs too late in the spring would retard the growth of the crop, preventing it from being ready for picking before fall frosts. Removing the water too early risked frost damage to the newly formed flowers on the vine, reducing the potential crop of berries.

White also described picking and packing the cranberry harvest. White recommended the use of wood peck-size boxes to protect the berries from bruising. White explained a more progressive method of keeping pickers accounts which was actually used at Whitesbog well into the twentieth century. Tickets were given to the pickers for each full peck box, redeemable at local stores or at the end of the harvest for cash. He estimated that pickers could earn between one and two dollars a day. Packing berries involved either temporarily storing damp berries in wood crates to air dry, or pouring peck boxes directly into a wood barrel. White described a fan-like device that could be clamped on the edge of the barrel. Pouring the berries through a hopper and turning a crank handle on the fan would blow away grass debris and shriveled berries while plump berries fell into the barrel. When storing the berries it was essential to keep them in a cool, dry place away from direct sunlight. Another early method of removing rotten berries after extended storage for spring sale was rolling the berries along a shallow trough and picking out the rotten ones which did not roll as easily as the solid ones.

Additional insight regarding the early development of the White family cranberry bogs in Burlington County is provided by a letter from Barclay White in a "Letters from Practical Growers" section at the end of the book. He listed four requirements for successful cranberry cultivation that echo his son's account: 1) a peat or muck soil, free from loam or clay; 2) clean beach sand for covering the peat; 3) a dam and water, to overflow the vines when necessary; 4) thorough drainage.[15] Another Pemberton, New Jersey grower Theodore Budd reflected on the experimental nature of local cranberry growing in the previous decade:

> At the time I commenced to cultivate the cranberry, it was a new business in this neighborhood. I had to gain knowledge by experience, which is by far the best way to acquire it. The articles that were written then on the culture of cranberries were detrimental to their growth, and calculated to lead the beginner from the laws of nature and success in the culture of the fruit.[16]

By filling the need for good information on cranberry growing described by Budd, White's book was a standard manual in cranberry agriculture for many decades.

White also offered cranberry vines and property for sale, and a consulting service for

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[15]White, *Cranberry Culture*, 106.

[16]White, *Cranberry Culture*, 112.

those thinking about starting a cranberry bog.[17] The idea of sharing information about cranberry cultivation also extended to the formation of a growers' association. Fenwick and White were also active in the formation of the American Cranberry Growers' Association in 1871, serving as the first president and secretary, respectively. The Growers' Association promoted standardized barrels and boxes for cranberry shipment, and collective promotion of cranberry growing and marketing. Sub-committees were formed that reflected the concerns of cranberry growers: cropping and marketing, flowing and drainage, grasses and weeds, insect enemies, scale diseases (rot), fertilizers, and standard measure. In Wisconsin on a consulting trip in 1871, White also acquired 3,000 acres rich in naturally-occurring cranberry vines. Just a few years later he yielded control of this cranberry plantation near Bear Mount to one of his partners. However these early experiences would be key to White's decades of work at Whitesbog. His approach to agriculture was technical and entrepreneurial, making him well-suited to the engineering and promotional task of creating a large-scale cranberry bog.[18]

J. J. White and the Expansion of Whitesbog

In 1875, J. J. White went to work as a machinist for H. B. Smith, an inventor and manufacturer of woodworking machinery located in Smithville, just above Mount Holly. As described by Bolger et. al. in the report assessing the creation of a Whitesbog Historic District, this seemingly incongruous move away from agriculture to manufacturing actually proved to be a great asset to White's cranberry interests in later years. Like other mechanically-inclined men of his era, White used practical experience as a machinist to develop into a self-taught mechanical engineer. White patented a number of different devices, including a belt-shifting pulley and a chain-making machine, and became general manager and a shareholder when H. B. Smith incorporated in 1878. Around 1880 White became manager of the Smith Company's main retail store on Market Street in Philadelphia, and ran his own machine shop on the upper floor. J. J. White's skill as a machinist and engineer combined with his detailed experience with cranberry agriculture prepared him well for his activities at Whitesbog. Large-scale cranberry agriculture required an engineered landscape to control and move water over the bogs, and specialized technology to process the harvest.[19]

J. J. White's dual career began in earnest when his father-in-law, James Fenwick, died in 1882. Fenwick left his cranberry bogs to his wife, and made White the executor and manager of

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[17]White, *Cranberry Culture*, 124.

[18]Carl Raymond Woodward. *Development of Agriculture in New Jersey, 1640-1880.* (New Brunswick, N.J.: New Jersey Agricultural Extension Service, Rutgers University, 1927), 242-243; Eck, *The American Cranberry*, 11. In *From Marsh to Farm*, Sebold points out that Woodward refers to the group as the New Jersey Cranberry Growers' Association, founded in 1873. Like Sebold I use the information in Eck.

See Joseph J. White "Cranberry Culture," 4-7, for an account of his Wisconsin activities in the early 1870s.

[19]William Bolger, Herbert J. Githens, and Edward S. Rutsch. *Historic Architectural Survey and Preservation Planning Project for the Village of Whitesbog.* (Morristown, N.J.: New Jersey Conservation Foundation, September 1982), 21-22.

his estate. White moved back to New Lisbon, and for the next seventeen years commuted to Philadelphia during the week, and traveled to the cranberry bogs on Saturdays. The Fenwick tract was 600 acres including fifty acres of cranberry bogs. This tract was administered separately from White's other business holdings to protect his mother-in-law's interests, but White began to slowly expand his own property to include adjacent land. In 1912 after Mary White inherited the Fenwick tract from her mother, the Fenwick and White tracts were joined and incorporated as J. J. White Inc. with holdings of 3,000 acres with 600 acres of cranberry bogs.[20]

White's expanded cranberry holdings were intended to both increase the acreage under production, and provide a consistent and ample water supply for his bogs. In the thirty years of major expansion of his bogs, White acquired "rights to a total of five streams as well as to the valuable swamps along and near them."[21] White began to expand his cranberry property starting in 1884 with the purchase of two parcels east of the Fenwick property on Cranberry Run totaling 168 acres. He later recounted that "upon acquiring this land I began to improve sixty acres above and adjoining the Fenwick tract," which his friends referred to as "White's Folly."[22]

Around 1890 White purchased Ditch Meadows, a 500-acre tract previously part of the Hanover Furnace property. From 1893 to 1895 White built five bogs along the old canal from the Pole Bridge Branch. From 1895 to 1897 the Pole Bridge area of the Fenwick tract was also developed into nine more bogs. Also in 1895 White purchased 500 more acres east of "White's Folly." This acquisition was particularly calculated to improve the water supply to White's bogs, and included the upper end of Cranberry Run and Antrim's Branch (a feeder stream from Hanover Lake). The right to dig a canal east to tap Gaunt's Branch was also included in this purchase; water flowed through the canal starting July 4, 1896. White constructed a reservoir at the foot of Job's Swamp to collect the water from the swamp and the canal; acquisition of the swamp also protected the Cranberry Run watershed. Subsequently 180 acres of bogs were built along Cranberry Run.[23]

The fifth and final area of expansion at Whitesbog was along the lower part of Antrim's Branch, where White acquired a 119-acre tract in two stages in 1902 and 1904. Six bogs were built along Antrim's Branch in 1905 and 1909. White described the basic technology of bog construction in *Cranberry Culture*. Earlier bogs tended to be more irregular in shape, follow natural contours, out of level, whereas new bogs have straight sides, regularly spaced canals and ditches. Throughout the bog irrigation system, White constructed small bridges and spillways to

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[20]Bolger et. al., 22-23.

[21]Bolger et. al., 23.

[22]J. J. White, "Cranberry Culture," 8-9.

[23]Bolger et. al., 25.

allow access and control.

Buildings at Whitesbog - Cranberry Sorting and Packing

As White expanded his bogs, the main village of Whitesbog and the worker housing villages of Rome and Florence were constructed on the property to provide both agricultural and residential buildings for the enlarged operation. Nearly all of the buildings at Whitesbog were constructed between 1882 and 1915, reflecting J. J. White's period of expansion and modernization at Whitesbog. During this period White's eldest daughter, Elizabeth Cade White, also began to work at the bogs with her father. She started by handing out credit tickets to the pickers during the cranberry harvest in 1893 and providing basic first aid learned through a course at Drexel University. White had four daughters, Elizabeth, Mary, Beulah, and Anne, of whom he diplomatically wrote in 1914: "I shall not close this record without acknowledging the hearty cooperation and valuable assistance of my daughters Elizabeth, Mary, Beulah and Anne in the conduct of my business. Although differing somewhat in temperament, tastes and talents they have all done what they could, and they have done much to help win success."[24] However Elizabeth alone never married and spent her long life pursuing her agricultural and horticultural interests at Whitesbog. In a period when professional opportunities for women were quite limited, Elizabeth became a largely self-taught horticultural expert and an important figure in both cranberry and blueberry agriculture.

Elizabeth White's career at Whitesbog coincided with her father's expansion of the bogs and supporting village structures during the 1890s and the first quarter of the twentieth century. By 1915 the main Whitesbog Village included a series of cranberry-related structures such as a massive warehouse and packing plant, barrel-making and barrel-storage structures, facilities for workers including a general store and housing, in addition to a water system with a tall holding tower and a series of related outbuildings. All but one of the structures extant in 1915 had been built since J. J. White began managing the property in 1882. This cluster of wood structures casually arranged along two perpendicular dirt roads was the functional and visual center of the Whitesbog landscape. The store building had been built in 1899 to serve a growing labor force. This building served in that capacity until 1924 when it was moved north of the central commons areas of the village and used exclusively as a dwelling. A replacement general store with living quarters upstairs for the storekeeper and his family was built on that site in 1924. This general store also housed the post office for Whitesbog which was officially established in 1923.[25]

Elizabeth White later recalled the facilities for cranberry storage and worker housing during the early 1890s. When she began working at Whitesbog, Fenwick's cranberry "cellar" was still extant. According to her description this was an above ground storage structure with an

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[24]J. J. White, "Cranberry Culture," 15-16.

[25]Bolger et. al., 34-35. Drawings and a specification list for the new general store are in the Whitesbog Preservation Trust collection, as well as the invoice for moving the old store building.

earthen floor and heavy masonry walls on the first floor, most likely designed to keep the cranberries cool. Initially workers were housed in the wood frame second story of this structure, but later the floor was removed and the one tall room was used exclusively for storage. This structure was on the east side of the village near the "Old Bog" to the south. In the 1890s the pickers were housed "close by in four or five 'black shanties,' small, frail buildings roofed with tar paper. A small house of four rooms and a shed stood between the cellar and the 'Old Bog'–the home of a year round man."[26]

As the cranberry acreage at Whitesbog was expanded, J. J. built a series of new warehouses and packing rooms to accommodate the increase, located on the west side of the village. According to his grandson Tom Darlington, J. J. White designed the cranberry packing plant now partially extant (as a ruin) in the main Whitesbog Village around the turn of the century. When completed in 1905 the main form of the heavy wood frame structure was approximately 600 feet long with two brick firewalls dividing it into three sections. The first section, or east end of the building, was built ca. 1890. The east section was a two-and-a-half story, T-shaped heavy timber frame storage warehouse and packing plant. This structure rested on stone and brick foundations and the walls were sheathed with cedar shingles. The east end of the structure was raised on brick piers to form a porte cochere entrance on the ground floor. A large double door was located over the porte cochere on this end. Historic photographs also show closely spaced windows on the east end of the ground floor north and south elevations. Seven evenly spaced doors were located along the rest of the south elevation ground floor. The second floor of both wings had uniformly spaced window openings with six over six wood sashes. The heavy timber framing system supported a metal standing seam gable roof and three evenly spaced cupolas on the main wing and one on the north wing.[27]

Construction of this cranberry storage and packing plant in the 1890s indicated the increased volume and sophistication of cranberry growing at Whitesbog. It is not clear exactly how the interior of this first packing plant was arranged. The row of closely spaced windows in the ground floor of the main wing probably provided natural light for a section of the building used for hand sorting. The doors along the ground floor of the remaining two-thirds of the wing perhaps provided ventilation for cranberry storage. This section of the plant was converted to

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[26]Elizabeth White. "Reminiscences of Whitesbog." (1941), 4.

[27]Information about the cranberry storage and packing plant at Whitesbog was compiled from several sources including historic photographs of the exterior and interior, two drawings of the 1905 expansion, and notes from an interview with Tom Darlington (12 October 1996) in the Whitesbog Preservation Trust collection at the former General Store building in Whitesbog Village. See field records for photocopies of 1905 drawings. Two reports also provided information about this structure, see Thomas Wells and Michelle Byers. "Whitesbog Historic District," Burlington and Ocean Counties, New Jersey, National Register of Historic Places Registration Form, 1988, U.S. Department of the Interior, National Park Service,Washington, D.C.; and William Bolger, Herbert J. Githens, and Edward S. Rutsch. *Historic Architectural Survey and Preservation Planning Project for the Village of Whitesbog*. Morristown, NJ: New Jersey Conservation Foundation, September 1982.

mechanical cold storage by the 1940s.

In 1905 J. J. White had drawings done for an approximately 400-foot addition to the packing plant, tripling it in length. The expansion by Philadelphia architectural firm Bunting and Shrigley created three distinct sections to the wood frame building, separated by brick firewalls extending above the roofline and capped with flagstone. Because Bunting and Shrigley designed very little industrial architecture, J. J. White was probably heavily involved with the design, a fact supported by oral accounts attributing the design to White. The original east section housed storage and packing; the new addition included a sorting house section in the center and another storage warehouse at the western end of the elongated structure. Presumably this expansion was needed to house both the mechanical sorting equipment invented by J.J. White, and to provide additional storage space for the growing cranberry crop at Whitesbog.[28]

Although similar in form to the original section, the addition was approximately four feet wider (32 feet total) and used a different truss system, resulting in a slightly lower pitch to the gable roof. Like the original structure the addition also had a standing-seam metal roof, stone and brick foundations, and walls covered with cedar shingles. Brick chimneys were located at the four corners of the storage section and at the center of the south elevation of the sorting section. A hand cart railway ran down the center bay of the entire structure on both floors to aid the movement of cranberries through the packing process. This narrow center bay was two feet six inches wide and flanked by the main vertical structural members. The two side bays created long uninterrupted work spaces thirteen feet six inches wide on either side in the storage house and fourteen feet six inches wide in the sorting room. A perpendicular section of hand cart rails with a circular turnabout was located near the east end of the storage house. This section of track ran to double doors on the north and south sides of the ground floor, allowing additional outside access to the storage area.

The storage and sorting sections had similar dimensions and forms, but were specially designed to fulfill their distinct functions. Freshly picked berries in wooden boxes were warm from the sunshine in the fields. Beyond simply holding the cranberries, the storage section of the packing plant had an improved design that very effectively kept the berries cool to prevent rotting. Large wood panels, six feet six inches by three feet eleven inches, along the north and south first floor walls were hinged to swing upwards. Instead of cupolas the newer storage house had a continuous louvered monitor along the ridge of the main gable roof. At night the roof vents and side panels were left open to encourage convection of the warm air and cooling to night temperatures. During the day the panels and roof vents were closed to retain the cool

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[28]For biographies and a Pennsylvania project list for Bunting and Shrigley see http://www.philadelphiabuildings.org. This webpage compiles information from several Philadelphia repositories and provides a searchable database of Philadelphia architects. Both Morgan Bunting and Arthur Shrigley were Quakers, and many of their early commissions were done for fellow Friends. Most of the firm's projects were residential or public structures such as schools. J. J. White's Quaker background and Philadelphia business contacts probably brought the firm to his attention.

temperatures and help preserve the cranberries. The underside of the roof in this section had an extra layer of wood sheathing for insulation. Trap doors (three feet six inches) placed every six feet in the second floor ceiling could be opened and closed from an elevated walkway to control air convection and temperature inside. On the first floor crates of cranberries were stacked on uncovered joists supported by brick piers. The piers were spaced to allow four cranberry boxes to be stacked lengthwise across either side storage area, leaving a two foot access aisle along the outside wall.

Fixed sash two-over-two light windows were located above the hinged panels on the first floor, and six over six movable sash windows were located at the second floor level. The second floor of the storage house had narrow floor boards installed with half inch gaps to allow free air circulation. The storage house also had open space in the eaves between the attic story joists to encourage air flow. Staircases were located at either end of this section. Large sliding doors were located at the first and second floor on the west elevation, the second floor accessible via an earthen ramp in front of the brick piers forming a porte cochere for the first floor. Later when electricity became available and the east section of the packing house converted to refrigerated cold storage, Tom Darlington noted that the natural methods used previously had worked just as well. Perhaps the west storage house was left with natural ventilation because of the effectiveness of the improved design.

The sorting section of the enlarged structure had a similar two-and-a-half story rectangular form with a gable roof and cedar shingle wall covering. One cupola was located in the center of the roof. Rather than being designed for airflow like the storage section, the sorting section was more substantially built with solid 7/8 inch thick floors and six over six movable wood sash windows on both stories. Each window light was ten by twelve inches. Raised platforms were built at either end of the first floor with the hand cart tracks situated lower in the narrow center bay of the structure. The tracks continued into a one-story, T-shaped ell on the north side of this section. Three sliding doors eighteen feet six inches wide were located at the north end of the ell with a driveway running under a porte couchere formed by the gable roof. These features and the location of the building between the final hand sorting process and the barrel warehouse suggests that sorted barrels of cranberries were loaded here for shipment to the produce markets of Philadelphia and New York.

Historic photographs, building plans, and general information about the process during the early twentieth century allows a reasonable reconstruction of cranberry sorting and packing at Whitesbog. Cranberries were initially stored in the two warehouse sections, with earthen ramps providing direct access to the second floor at either end of the packing plant. Standard procedure for cranberry storage and sorting dictated that the berries be stored in wood boxes and kept cool until shortly before shipment. Then the berries would be sorted and packed in wood barrels for transport. According to one observer in 1914:

I do not think the berries were ever cleaned as received at the edge of the bog,

> certainly not since cranberry growing has been an industry of any importance. The berries are stored with all the grass and vines that may be included with the berries and not cleaned till they are to be shipped; be the time one week or six months. The old fan on a barrel or crate was one move from pouring the berries from a basket or box held high above the head onto a sheet of some sort on the ground, allowing the wind to blow the 'chaff' away. Nowadays, the store houses on the better bogs are equipped with elaborate and expensive sorting machinery.[29]

Handling the berries while sorting could cause rot, so sorting was done right before shipment and use to reduce loss. Generally cranberries were sorted, packed, and shipped shortly after harvest during the high demand around the winter holidays. Cranberries stored through the winter would command high prices because of scarcity, but shrinkage and rot could substantially reduce the volume of the crop before sale.[30]

Rail tracks through the center of the long structure at Whitesbog allowed workers to easily push carts of fresh cranberries through the sorting process. Section drawings indicated platforms for the sorting machines at either end of sorting house first floor. These machines were arranged perpendicular to the rail track. At Whitesbog a cranberry sorting machine patented by J.J. White in 1903 was used. White's "Machine for Assorting Fruit" appeared from the outside to be a rectangular box, approximately six feet long, raised on wood legs. The inside of the machine had a series of shaking and "selecting plates" to sort cranberries into firsts and seconds, by firmness, and also to sort by size. Smaller berries were sold for pies or for canning. Cranberries were poured into a hopper and moved over the plates with the aid of hand cranked belts and conveyors. Good berries would bounce through the process and be collected in barrels, weeding out the rotten berries along the way. A counterbalanced scoop in the barrel kept the good berries from being damaged by falling from the sorter to the bottom of the container. J. J. White wrote in 1914 that after "much experimenting" his patented device was able to separate frosted from sound cranberries, and twenty-four machines were installed in the sorting room at Whitesbog.[31]

White's sorter did not become a widespread industry standard although it was well-regarded and used at Whitesbog until at least the 1940s. A 1907 letter to White from A.U. Chaney of Wisconsin Cranberry Sales Co. described a site visit to Whitesbog by a group of Wisconsin growers. Chaney related that "they gave you compliments on the cranberry machine

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[29]Rev. Augustine Elmendorf. *The Cranberry Bogs of Burlington County, New Jersey.* (Social Service Commissions of the Dioceses of Newark and New Jersey, 1914), n.p.

[30]Charles S. Beckwith. *Circular 246: Cranberry Growing in New Jersey.* (New Brunswick: N.J. Agricultural Experiment Station, March 1931), 17.

[31]U.S. Patent Office No. 731,828, Joseph J. White, "Machine for Assorting Fruit," (23 June 1903). J. J. White applied for this patent on March 12, 1902. Joseph J. White, "Cranberry Culture," 13.

you are getting out, and from what they tell me about it it will mean a great improvement and a great boom [sic.] to the industry, and hope you will soon get them so they will soon be marketable and put in general use."[32] Chaney also asked that White install his machine at Chaney's Chicago and New York offices. John Gaynor, a Wisconsin grower and secretary of Wisconsin Cranberry Sales, wrote to White "your work suggested a great many thots [sic.] that were wholly new to me." He complimented White's sorting machine, especially the use of vibrating plates to remove the soft berries. Gaynor also wrote "your scheme for throwing open your cranberry house to the winds, giving a horizontal circulation and the space for taking in air below the fruit so that it may circulate vertically thru the fruit are all original ideas, wholly unknown to our Wisconsin growers."[33] White's sorter was very effective, but required skilled mechanics to repair and adjust the delicately calibrated gearing and plates.

In general combined separator and sizing machines like White's were falling out of favor by the 1920s because they needed "much more constant attention and adjustment" than two different machines used for each of these tasks.[34] A commonly used separator was the Hayden Separator manufactured in Massachusetts. This simpler device was easier to maintain and operated on the same basic principle of bouncing the good berries. The Hayden Separator was arranged vertically, instead of horizontally like White's sorter. Cranberries were fed into a hopper at the top and the firm, good berries bounced down a series of stepped oscillating rolls. The good berries then passed over a wire grader which separated the small pie berries from the rest. Whitesbog may have also had some Hayden or Hayden-type separators as indicated by a chart from 1917 comparing the results of sorting by "bounce machine," the White machine, and by hand. The White machine sorted out the least bad berries; perhaps an indication that good berries were not accidentally discarded by the more precisely calibrated machinery. Indeed the percentage of bad berries sorted by the White machine was closest to the hand sorting percentage, while the "bounce machine" discarded nearly five percent more of one cranberry variety.[35] Conversely, the White machine may have been missing more bad berries. Exact comparisons of the effectiveness of each type of machine are not available. By the 1930s, some

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[32]Letter from A. U Chaney to J. J. White, (30 April 1907), Whitesbog Preservation Trust collection.

[33]Letter from John A. Gaynor to J. J. White (13 May 1907), Whitesbog Preservation Trust collection.

[34]Photographs in the New Jersey State Archives circa 1940 show Elizabeth White in the Whitesbog packing plant observing the use of her father's patented sorting machines. See the field records of this project for a photocopy of NJDA Photograph No. 1453, New Jersey State Archives, Trenton, N.J.. Franklin, 18-19. This source also mentions that a combined machine which sorted the cranberries into five different sizes was still popular in Wisconsin. Hayden separator is used to illustrate the typical "modern cranberry separator for grading and sorting," presumably most popular in Massachusetts and New Jersey.

[35]"Bounce vs. White Machine vs. Hand Sorting," 13 December 1917, chart in Whitesbog Preservation Trust collections.

of the temperamental J. J. White sorting machines were replaced by Hayden Separators.[36]

After passing through the sorting machine, the cranberries were moved to the cranberry sorting tables along the outer wall of the first floor. Hand sorting was located in the center of the sorting house first floor. Here the windows were spaced five feet on center instead of six to provide more natural light. Historic photographs show hand sorting tables suspended from the wall. The tables had a raised lip along the edges to keep the cranberries from rolling off and were painted white to aid in spotting discolored or soft berries missed by the mechanical sorter. The tables at Whitesbog were originally stationary with workers sitting on stools picking out the discolored cranberries or any rotten ones that made it through the sorter. The sorted cranberries were packed in barrels and probably moved to the ell on the north side of the sorting room to await shipment. Hand sorting on moving belts was considered more efficient by the 1920s.[37] New Jersey Department of Agriculture photographs show moving belts in use at Whitesbog circa 1940 for both hand sorting and moving the berries to be packed in wooden boxes.[38]

Although White's packing plant was exceptionally large, the basic principles behind its arrangement were representative of the cranberry industry during the early twentieth century. In 1924, a U.S. Department of Agriculture bulletin on "cranberry harvesting and handling" urged that a "storage house should be conveniently arranged for sorting and packing the berries, as well as for storing them, and so constructed that it can be readily ventilated and a relatively uniform low temperature maintained."[39] Specific recommendations including building the storage house into a hillside to allow direct access to the top floor, and then running the berries through separators to the lower floor. Opening doors and windows allowed air circulation to dry and cool the cranberries stored in stacked wood crates, crucial to preventing rotting. Like Whitesbog, "some storage houses have sections of the sides which can be opened and closed, while others have windows and doors only for use in ventilating."[40] This bulletin included a photograph of White's storage and packing house, and Whitesbog was specifically mentioned in the text as an example where "one grower employs a large fan to force the cool night air through his storage house. By its use the temperature of the berries can be kept low."[41] Today the structure is largely in ruins after fire destroyed one-third of the building in 1961 and another third

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[36]Bolger et. al, 51.

[37]Franklin et. al., 27.

[38]See New Jersey Department of Agriculture photographs No. 1454 and 1455, New Jersey State Archives, Trenton, N.J.

[39]Henry J. Franklin, George M. Darrow, and O. G. Malde. *Farmers' Bulletin No. 1402: Cranberry Harvesting and Handling*. (Washington, D.C.: U.S. Department of Agriculture, April 1924), 14.

[40]Franklin et. al., 16.

[41]Franklin et. al., 16.

in 1970. The west storage house section is still partially standing, having survived via the brick firewall on its east end.

Across the road north of the packing and storage house are structures used for barrel making and storage, originally connected by an elevated railway. Year-round workers made barrels during the winter with the assistance of itinerant coopers. The barrel making factory is an one-story, heavy wood frame structure with a brick foundation sited perpendicular to the both the main cranberry and barrel storage houses. It is rectangular in plan (25 by 70 feet) with a double door in the center of the south elevation facing the cranberry packing and storage house. Cedar shingles cover the exterior walls and the gable roof has a standing metal seam covering. Because the materials and form of this structure are similar to the cranberry packing and storage house, it probably was also built around 1905. A series of six over six wood sash windows along the long side elevations and a brick chimney at the rear of the ridge line are indicative of the need for natural light and heat for the workers in the building, unlike the barrel storage building.[42]

The barrels were stored in an adjacent warehouse that could also store cranberries if the main warehouse spaces were filled. The barrel warehouse is an one-story, heavy wood frame structure with a concrete foundation sited parallel to the packing and storage house. It is rectangular in plan (32 by 112 feet) with primary access via seven evenly spaced doors on the south elevation facing the packing house. A central sliding door at each end of the structure is flanked by two six over six wood sash windows. Vertical wood tongue and groove siding nine inches wide covers the exterior walls. The barrel warehouse has a standing metal seam gable roof. Like the larger main cranberry warehouse, a hand cart railway is located in the center of the barrel storage house. The gaps between the floorboards indicate the need for ventilation when this building was used for overflow cranberry storage.[43]

After construction of these cranberry-processing related structures, J. J. White installed a fire protection water system in the main Whitesbog village during 1914. The water system included a water tank on a tall tower, a brick pump house, a brick and frame compressor-generator house, a wood frame filter house, and a series of hydrants to protect key cranberry buildings. The water tank and associated structures are still located just behind the general store building at the northwest side of the village commons. The water tank is a striking landmark for Whitesbog as the tallest structure for many miles. It also provided a panoramic view of the flat landscape that could be used to watch for forest fires in dry weather. The water tank and tower consists of a wood tank on an octagonal base standing on four cross-braced iron legs. The tank was built by Hall Wolford Co. of Philadelphia and the tower by Flint Walling Manufacturing

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[42]Thomas Wells and Michelle Byers. "Whitesbog Historic District," Burlington and Ocean Counties, New Jersey, National Register of Historic Places Registration Form, 1988, U.S. Department of the Interior, National Park Service, Washington, D.C.

[43]Bolger et. al., 43; Wells and Byers, "Whitesbog Historic District." Given the chronology of the site and the appearance of the barrel storage warehouse it was probably built c. 1910.

Company.[44] A partially subterranean brick pump house is located below the tank. The half brick, half wood frame compressor-generator structure stands immediately next to the base of the tower. The fire suppression system supported by this water supply was installed by R. D. Wood and Company of Philadelphia. The filter house removed iron and other particulate matter from the water used for domestic consumption at Whitesbog.[45]

The 1915 New Jersey State Census indicated that forty-one workers (eighty-eight people including family members) were year-round residents at Whitesbog. The workers lived in the modest two-story wood structures on the west and north sides of the village. These residents were mainly laborers working during the off-season performing maintenance duties such as sanding and weeding the bogs, repairing dams and waterways, and making barrels for shipping cranberries. Twelve of the twenty-eight households listed in the census included first generation Italian immigrants, while the rest were natives of New Jersey or surrounding states. In addition to laborers, full-time residents at Whitesbog included a superintendent, two assistants, an engineer, a carpenter, and a bookkeeper. J. J. White continued to live in New Lisbon and travel to Whitesbog to manage his cranberry bogs, but the next generation of the White family was beginning to settle in the village. White's daughter Mary and her husband Emlen Darlington lived in an Arts and Crafts-inspired house built on the east side of the village in 1915. A similar house had been built across the road to the north for superintendent Joseph Haines ca. 1912.[46]

Marketing Cranberries

As J. J. White was expanding and modernizing Whitesbog during the 1890s and early twentieth century, he also remained active in promoting cooperation among cranberry growers. The Growers' Cranberry Company was founded in 1895 as a selling agency for growers in New Jersey and Massachusetts. A selling agent located in Philadelphia coordinated the sale of cranberries for many growers, helping to control distribution of the crop and price fluctuations. Each grower received the proceeds of the sale of his berries minus a five percent commission. Cooperation helped thwart price cutting by unethical jobbers, and helped distribute the rapid increase in production by the turn of the twentieth century. According to Paul Eck, "cranberries were never marketed according to varietal names as apples are today, [however] during the heyday of fresh fruit sales cranberries were sold by brand name."[47] Brand names were associated

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[44]The tank and tower were rebuilt in 1950 and 1986. This information is courtesy of Chris Bethmann.

[45]Wells and Byers, "Whitesbog Historic District."

[46]Bolger et. al., 33, 35. The U.S. Census of 1920 was taken during January of that year. Because Whitesbog was part of the Pemberton Twp. enumeration district it is difficult to be certain who was living in Whitesbog village. The census lists Joseph Haines, J. J. White Inc. superintendent, Robert Clark, manager of the general store, eight heads of household with the occupation of laborer or "cranberry bog," and Sidney Hutton, a horticulturist who assisted Elizabeth White with her work.

[47]Eck, *The American Cranberry*, 343, 344-345; Bolger et. al., 43.

both with certain varieties and quality levels. Brand names, or labels, established by the Growers' Cranberry Company included Heather, American Beauty, Silver Harvest, Red Clover, or Sunrise. J. J. White sold his cranberries under the White Star brand, which was considered high quality.

In 1904 J. J. White was promoting an even broader-reaching cooperative marketing association, the American Cranberry Company, with the Growers' Cranberry Company, Cape Cod Cranberry Company, and Wisconsin Cranberry Company as associated regional organizations. White based his proposal on the citrus growers organizations he observed during a trip to California during the winter of 1903-04. He cautioned the directors of the Growers Cranberry Company:

> Most of us are extending out plantations as rapidly as our means and circumstances will permit, and what is true of us is true of almost every successful grower in the country. And yet, while we are nearly all extending out acreage as fast as possible, not one of us is expending a dollar to extend the market so that is will be able to receive and dispose of the increased production. We are not only doing nothing to increase the demand for our fruit, we are distributing it in a hap-hazard, wasteful and expensive way.[48]

The individual growers would still pack, grade, and brand their own cranberries, but be part of a larger, more coordinated marketing system. The Growers' Cranberry Company did not immediately adopt White's proposal, and instead saw a competing organization, the National Fruit Exchange, formed in 1907 with a similar structure to White's proposal. The National Fruit Exchange included three regional cranberry organizations one each from New Jersey, Wisconsin, and Massachusetts. This organization "pooled" cranberries of the same variety under a common brand name, a method which provided to be more efficient for marketing the product of a larger organization. At the end of the growing season the various prices for a given brand were averaged and the proceeds distributed to the various growers, protecting the members from price fluctuations.[49]

Initially the members of the Growers' Cranberry Company resisted giving up their individual brand names. In an address to the Growers' Cranberry Company, J. J. White urged fair consideration of the consolidation issue, given the benefits of having one cranberry growers organization in New Jersey and a larger marketing network. He reminded the membership:

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[48]Joseph J. White. "Cooperative Marketing." read before the directors of the Growers' Cranberry Co., (6 April 1904), 1.

[49]Eck, *The American Cranberry*, 345; Asher Hobson and J. Burton Chaney. *Bulletin No. 1109: Sales Methods and Policies of a Growers' National Marketing Agency*. Washington, D.C.: U.S. Department of Agriculture, (16 January 1923), 13-14.

> Perhaps I would sacrifice more than any one of your [sic] in going from private brands to the pooling system. I have been using for several years a brand that is registered in the United States Patent office, and that has a National reputation. During the last two years I have shipped 100,000 bushels of Cranberries under this brand, and yet I am willing to sacrifice this, if necessary, to gain more.[50]

Finally in 1911 with the threat of defection by the Massachusetts members, the National Fruit Exchange was reorganized as the American Cranberry Exchange, and combined with the membership of the Growers' Cranberry Company. Later a small percentage of each growers' profit was used for advertising campaigns to generally increase cranberry consumption, an effort deemed successful after a 1916 trial in Chicago raised cranberry consumption 47 ½ percent compared to the year before. Eventually the individual grower's brands were eliminated for the common brand name, Eatmor. By 1923 the American Cranberry Exchange was selling 75 percent of the Wisconsin crop, and 65 percent of both the New Jersey and Massachusetts crops under the Eatmor name. The Eatmor brand name greatly facilitated advertising and became so well known than in 1953 the American Cranberry Exchange changed its name to Eatmor Cranberries Inc. These efforts would modernize the approach to marketing and selling cranberries to match progressive growing and processing techniques.[51]

Labor Issues at Whitesbog

Whitesbog was exceptional for its infrastructure and year-round work force, particularly given the dominance of small family-run farms and seasonal labor in New Jersey agriculture. During the late nineteenth century, the agricultural economy of New Jersey became dominated by "truck farming," small farms growing an assortment of produce for the lucrative New York and Philadelphia markets. These small diversified farms inspired New Jersey's nickname of "the Garden State." Year-round work for farm laborers was scarce, but seasonal harvests created a great need for temporary help. This development in farming patterns coincided with an outpouring of migration from Southern Italy. Many of these immigrants were farm workers in Italy, but gravitated to cities like Philadelphia with the promise of high industrial wages. This migratory process and its impact on the local agriculture was described in *The Fruits of Their Labor* by historian Cindy Hahamovitch. Hahamovitch explained that as families replaced the initial wave of male immigrants, "instead of saving for land in Italy, these permanent immigrants devoted every cent they earned to the 'family economy.'...It was the labor of married women and children that made the difference between subsistence and starvation."[52] Harvest season on the South Jersey farms coincided with seasonal lay-offs in the garment and hat trades which

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[50]Joseph J. White. "Fellow stockholders of the Growers Cranberry Company." (c. 1911), typescript in Whitesbog Preservation Trust collection, 5.

[51]Hobson and Chaney, 17; Eck, *The American Cranberry*, 346-347.

[52]Cindy Hahamovitch. *The Fruits of Their Labor: Atlantic Coast Farmworkers and the Making of Migrant Poverty, 1870-1945*. (Chapel Hill and London: University of North Carolina Press, 1997), 30.

employed many Italian immigrant women. Men employed in construction and industrial work also took advantage of work lulls to join their families in farm work during the harvest. According to Hahamovitch: "Due to the seasonality of women's work, men's high rates of industrial unemployment, and cultural pressures on Italian women to care personally for their children, the needs of Italian families suited the labor demands of South Jersey's growers."[53] Some families would move from crop to crop, harvesting strawberries and potatoes earlier in the season, tomatoes and peaches in the summer, and cranberries in the fall.

At Whitesbog, the availability of this labor supply coincided with the growth J.J. White's cranberry operation. More workers were needed during the fall harvest for the painstaking handpicking process. Through the second half of the nineteenth century, local Pine Barrens residents constituted the labor force at Whitesbog. After the turn of the century families of Italian immigrants largely replaced local native-born workers as the seasonal cranberry harvest workforce, many traveling from South Philadelphia to spend four to six weeks at Whitesbog. In 1914 Elizabeth White described the transition from "American" to Italian immigrant labor:

> When my personal work at the bog began [1893], all the help, including the two hundred odd pickers, were from the pines. After two years these began turning to other work to such an extent that we engaged ten or fifteen Italian for the picking season and they have gradually replaced the pine people, the better classes of whom have found more profitable work, till latterly the 400 to 500 pickers have been more than ninety percent Italians.[54]

Previously, a few shanties were provided for itinerant laborers, but the majority of the pickers were local pines families who walked or rode horses to the bogs each day. This commuting workforce was more difficult to control, with many pickers starting and ending work when they pleased, and declining to pick when the fruit was more sparse. Another account said that "someone who was having an especially large amount of [labor] trouble got one or two Italian families to help pick their berries and they have gradually replaced the native help on the larger bogs, where the willingness of the Italians to conform to reasonable rules made it more possible to conduct business in a business like way."[55]

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[53]Hahamovitch, 32. For Hahamovitch's larger discussion of these issues see Chapter 1 "A Perfectly Irresistible Change: The Transformation of East Coast Agriculture," especially pp. 28-32. A good primary source on Italian migration from crop to crop in New Jersey is Mina C. Ginger. "In Berry Field and Bog." *Charities and the Commons* 15:5 (4 November 1905): 162-169. Her study was sponsored by the Consumers' Leagues of Philadelphia and New Jersey.

[54]Elizabeth C. White. "Cranberries and Colony Contributions: Or the Appeal of the Colony to a Dweller in the Pines." typescript of address read before the New Jersey Conference of Charities and Correction, Asbury Park, NJ, (21 April 1914): 3.

[55]Rev. Augustine Elmendorf. "The New Jersey Cranberry Bogs." typescript report in Whitesbog Preservation Trust collection, 1914

The same Italian families tended to return to Whitesbog each season. Carrying household goods and supplies not available at the Whitesbog General Store like Italian cheese, bread and sausages, and olive oil, these families took the train from Philadelphia to Upton Station and walked or rode in carriages to Whitesbog. They were recruited, transported, and managed by padroni, or bosses. Padroni arranged for transportation to the bogs and then oversaw their work on the bogs, earning a fee from each family at the end of the harvest. Reformers were concerned about abuses to this system, but the workers did benefit from their labor. A family could earn enough money during the harvest to buy clothes, or coal for heating through the winter. The hours of picking were usually 7:30am to 5:00pm with a half hour lunch break.

The shift to Italian workers required construction of temporary housing for those relocating from Philadelphia for the harvest, a new and unaccustomed expense. While other growers left the padrone in charge of housing and other services for the workers, the conditions were better than average at Whitesbog. According to Elizabeth White, the large barracks-like pickers' quarters at Whitesbog were copied from a neighboring bog owned by Theodore Budd, and many of the other large bogs in the area had the same type of houses.[56] Whitesbog was frequently noted as having superior housing conditions while smaller bogs might simply have one-room shacks.[57] Two groupings of these temporary housing barracks, named Rome and Florence by the Italian workers, sheltered the cranberry harvest workforce. Rome was located to the east of the main village and Florence roughly to the north. In 1911 Elizabeth White described the seasonal worker housing at Whitesbog. She listed six buildings of the "Florence type" with sixteen rooms each, and seven buildings of the Rome type with nineteen rooms each. The tendency was to build new quarters after especially crowded and productive harvest seasons such as 1910 and 1914.[58]

These worker houses were used into the 1960s and then burned and razed after Lebanon State Forest acquired the site in 1967 because of their dilapidated condition. Photographic evidence and historic descriptions give some sense what these worker houses were like. The "Rome" type of structure seems to been the first built at Whitesbog for the new influx of Italian workers, and also found on other local bogs. They were twenty by forty feet, two-story, side-gable wood frame structures with thin horizontal wood clapboard siding. These houses had brick

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[56]Elizabeth C. White. "Cranberries and Colony Contributions," 8.

[57]Rev. Augustine Elmendorf. *The Cranberry Bogs of Burlington County, New Jersey*. (Social Service Commissions of the Dioceses of Newark and New Jersey, 1914). The typescript version of the report contains some information omitted from the published booklet version.

[58]Letter from Elizabeth C. White to Owen Lovejoy, (14 October 1911), Whitesbog Preservation Trust collection; Rev. Augustine Elmendorf. "The New Jersey Cranberry Bogs." typescript report in Whitesbog Collection, 1914; Rev. Augustine Elmendorf. *The Cranberry Bogs of Burlington County, New Jersey*. (Social Service Commissions of the Dioceses of Newark and New Jersey, 1914). Hahamovitch, Chapter 2 "The Sacrifice of Golden Boys and Girls: the Padrone System and New Jersey Agriculture," was also useful to this section.

foundations, and were apparently not heated.[59]

Descriptions of the layout of the Rome "barracks" indicated that they were divided into twenty rooms each approximately seven by seven feet square. A central entrance hall was seven feet wide and allowed access to the ten rooms on the first floor and the stairs to the ten rooms on the second floor. The ceilings were approximately seven feet high, with the second story rooms having a sloped ceiling formed by the roof of the structure. Each room had one (the corner rooms may have had two) twenty-two by eighteen inch window openings with a six-over-six sash window. On the second floor the windows were at the top of the walls just below the sill for the common rafter roof structure.[60]

The interiors of two workers' rooms at Rome were photographed by Lewis Hine in September 1910. These photographs document the unfinished quality of these spaces. The studs, rafters, and exterior siding were exposed in these thin walled, seasonal structures. Each small room had an upper bunk built into the wall and a lower bunk on the floor below. In the Hine's photographs, clothes are hung from the walls, and a barrel, dishes and other personal possessions are visible. One photograph is of room 75 in shanty 4 at Rome, occupied by Paulo Biniristo and his wife. Their four sons occupied a neighboring room. The caption noted the "bread and other food lying around unprotected. Plenty of flies." The other photograph shows room 21 in shanty 2. Rocco DeGruerio's family lived in this room during that picking season. Separate bathrooms for men and women were provided for Rome outside the houses.[61] By the mid-1910s, the Rome houses were considered older and less well-cared for than the structures in the Florence grouping although in 1912 the six Rome structures were worth $6,000.[62]

The Florence migrant worker village was a slightly newer grouping of seven large "barracks" structures. One was the "Rome" type with a common entrance hall while the other six were described by White as the "Florence" type. These twenty by forty feet, two-story, side gable, wood frame structures were similar in exterior form to the Rome structures. The Florence

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[59]Public Education and Child Labor Association of Pennsylvania "Report of Investigators," (typescript in Whitesbog Preservation Trust collection, 1915), 17.

[60]Public Education and Child Labor Association of Pennsylvania "Report of Investigators," (typescript in Whitesbog Preservation Trust collection, 1915), 17; Charles L. Chute. "The Cost of the Cranberry Sauce." *The Survey* 27:9 (2 December 1911): 1284.

[61]The Lewis Hine photographs of the houses at Rome and Florence are found in the Library of Congress, Prints and Photographs Reading Room. A number of Lewis Hine photographs of child laborers at Whitesbog are found in RG102, Series LH, Lewis Hine Photographs for the National Child Labor Committee, 1908-1912, Still Picture Division, National Archives and Records Administration, College Park, M.D.. Photographs of the houses at Rome and Florence are also in the Whitesbog Preservation Trust collection.

[62]J. J. White, Inc. "Opening Entries in Books of Joseph J. White, Inc., New Lisbon, N.J.," (1 April 1912), typescript in Whitesbog Preservation Trust collection.

structures had cedar shingle siding and roofs, and a brick foundation and chimneys. Florence-type houses were divided into sixteen rooms, or eight two room units, one up and one down, sharing a private staircase and exterior door. The facade of the structures was symmetrical with a window bay on each end, and a pair of doors with a concrete stoop between the end and two center window bays. Each room appears to have one window opening with a six over six movable sash. Like the Rome-type, the second floor windows were located directly under the roof sill, suggesting that the space under the roof was part of the rooms on the second floor.

In 1912 the seven barracks structures at Florence were worth $7,000, suggesting that although the Florence type structures were considered better because of their increased privacy and better maintenance, they were similar in construction to the Rome-type structures.[63] Historic photographs show the six Florence structures lined up in a row along a dirt street. Some of the paired door openings were covered by a makeshift shed porch roof. Each structure had two chimneys, each running through an interior partition wall to allow access by four of the two-room units. Stoves connected to the chimneys heated the rooms. Florence also had two artesian wells for drinking water, one at either end of the village and water pumps in between for general purposes. Separate bathrooms for men and women were also provided.

Hine photographed the interior of one room at Florence in September 1910. This room was occupied by Joseph Mermilla's family, six people total. It is not clear whether this was one of the Florence-type structures, or the one Rome-type structure at Florence. The photograph shows a similar unfinished, exposed stud interior and built-in bunks. The Florence-type structures were described by reformers in 1915 as having ten by ten foot rooms, with three rooms occupied by families of three, one by a family of four, and two downstairs and three upstairs rooms occupied by a family of ten.[64]

Cooking was done over open campfires, with a few limited cookhouses for rainy days. Outdoor bakeovens were located at Florence, as well as covered cookhouses and tables for eating. In 1912 cookhouses and bake ovens were valued at $1,800. Supplies were available a short walk away at the general store in the main village. Other buildings used by the pickers were an assembly hall at Florence and three small houses (two with two rooms and one with four) for year-round Italian workers. A dance hall was located adjacent to the boss's house at Rome. This house was built in 1911 for Gus Donato, the *padrone* at Whitesbog. Elizabeth White wrote: "The superior housing conditions mentioned as existing on our bog consist principally of the small halls for dancing and recreation in rainy weather and a more liberal supply of toilets. Most if not all of the large growers have pickers quarters of the same type as

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[63]J. J. White, Inc. "Opening Entries in Books of Joseph J. White, Inc., New Lisbon, N.J.," (1 April 1912), typescript in Whitesbog Preservation Trust collection.

[64]Public Education and Child Labor Association of Pennsylvania "Report of Investigators," (typescript in Whitesbog Preservation Trust collection, 1915), 16.

ours."[65]

In 1911 the seasonal structures at Whitesbog housed 705 people (approximately 400 pickers, plus small children and elderly relatives). Elizabeth White calculated that 233 rooms were available to the pickers, suggesting an average occupancy of three people per room.[66] This occupancy figure was verified by the reformers researching the New Jersey cranberry industry. The pickers' villages at Whitesbog continued to expand to accommodate the growing workforce. By 1918, Rome included six two-story pickers' quarters (presumably barracks of the Rome type), a two-story boss's house with a connected dance hall, a bake house, and a cook house. Florence had eight pickers' quarters (presumably one Rome and seven Florence-type barracks), one double dwelling, one single dwelling, a bake house, and a cook house.[67]

As cranberry production expanded at Whitesbog and throughout the New Jersey bogs, the dependence on Italian labor from Philadelphia grew as well. The presence of young children on the cranberry bogs incited an outpouring of Progressive-era protest about child labor and living conditions for migrant worker families. The Whites, as owners of the largest bog in New Jersey and through their leadership in the Growers Cranberry Company, found themselves at the center of this controversy. An expose´ entitled "The Cost of the Cranberry Sauce" was published in the January 1911 issue of *The Survey* with Lewis Hine's photographs. Owen Lovejoy, General Secretary of the National Child Labor Committee, wrote:

> The vast stretches of marsh land in central New Jersey, formerly useless and barren, are now for five to seven weeks in the autumn overrun with a veritable army, organized and drilled to clean the region of its harvest....A few in the army are men and women, but many in the rank and file bending in a deadening monotony of toil under the omnipotent scepter of the *padrone*, are little boys and girls from fourteen years down to seven, or six, or five, whose hard labor must serve the mutual advantage of the employed parent and the hiring boss, and for whose protection no law exists.[68]

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[65]Letter from Elizabeth C. White to Miss McDougall (13 November 1913), Whitesbog Preservation Trust collection; Elizabeth C. White. "A Short Report of the Cranberry Bog Situation." read before the New Jersey Conference of Charities and Correction, Princeton, N.J., (April 1911); J. J. White, Inc. "Opening Entries in Books of Joseph J. White, Inc., New Lisbon, N.J.," (1 April 1912), typescript in Whitesbog Preservation Trust collection; Public Education and Child Labor Association of Pennsylvania "Report of Investigators," (typescript in Whitesbog Preservation Trust collection, 1915), 17.

[66]Letter from Elizabeth C. White to Owen Lovejoy (14 October 1911), Whitesbog Preservation Trust collection.

[67]Excerpt of Burlington County Rating Sheet No. 318 for "White Boggs," (2 August 1918), Whitesbog Preservation Trust collection.

[68]Owen R. Lovejoy. "The Cost of the Cranberry Sauce." *The Survey* 25:15 (7 January 1911): 605.

The article reported that during the 1910 harvest in New Jersey, 864 children ages four to fourteen were found working at six cranberry bogs. Claims by bog owners that the children were not compelled to work were dismissed in the article with colorful language about parents urging their children "by curses and cuffs" and the *padrone* "swinging his club above the backs of tiny girls."[69] Unfair peck measures and transportation fees, soggy bogs, mosquitoes, unsanitary shanties, children carrying heavy peck boxes to the foreman, and missed time from school were among the evils found at New Jersey cranberry bogs by reformers.

One of NCLC's primary concerns was the migrant worker housing conditions. The *Survey* article included scathing descriptions of bog housing conditions:

> To house this army of pickers during the brief season of employment, the bog owner carefully observes the principle of minimum cost. Shacks and barracks are erected to house one, two, six or twenty-four families, families of five or six persons living in a single room. One large shack, quite recently built, contains twenty-four rooms, each measuring five and one-half by six and one-half feet.... The sanitary conditions of these pickers' shanties are intolerable, and challenge the rigorous attention of those in our country who are awakening to the waste and extravagance of filth and disease.[70]

The mention of large barracks-type housing as well as small shacks seemed to equally indict the large progressive growers such as the Whites and the smaller growers. In spite of the severely critical tone of the article, Lovejoy did acknowledge that there were financial incentives for the families working at the bogs. A mother, father and six children ages seven to seventeen could earn between sixty-five and seventy dollars per seven-day week. The father averaged twenty pecks a day while the youngest child averaged four. During the winter in the Philadelphia, he estimated that the same family could earn only twenty-four dollars a week with the paid labor of the father, as a junk dealer, and the three oldest children.[71]

Although Lovejoy does not specify in the article which bogs were surveyed, other records indicate that Whitesbog, the largest cranberry complex in the state, was visited. Correspondence between Lovejoy and both J. J. and Elizabeth White regarding the NCLC surveys exists in the

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[69]Lovejoy, "The Cost of the Cranberry Sauce," 606-607.

[70]Lovejoy, "The Cost of the Cranberry Sauce," 608. The remainder of this quote reads: "A bunk, extending along the wall and about four feet above the floor, occupies half the room. The floor under the bunk is covered with a mattress, used as a bed for the children. In some of these rooms were found last season eight people, four sleeping on the bunk and four on the floor. Around the room hung clothing, food and other supplies. The food attracts swarms of flies and the odor in the house is nauseating. Although windows are built to open, they are almost invariably nailed shut."

[71]Lovejoy, "The Cost of the Cranberry Sauce," 608.

Whitesbog Preservation Trust collections. J. J. White wrote to Lovejoy on November 29, 1910 on behalf of the Growers Cranberry Company to complain about "absolutely untrue" statements in a leaflet version of the text later published in the *Survey*. Lovejoy largely dismissed his complaints with the contention that relatively better conditions at the bogs compared to immigrant city neighborhoods was not a justification for exploitation.[72]

On December 16, 1910, J. J. White replied, refuting point by point the NCLC's argument. He claimed that the sensational and misleading claims failed to understand that children are not forced to work, Italian parents were "careful and affectionate" with their children, oversized peck measures were used to account for debris in the cranberries, and other points. White did admit that the houses were crowded, but sanitary, and the children missed six weeks of school, but "they gain more than they lose by their outing in the Jersey pines." He mentioned Elizabeth's first aid training at Drexel University and care of the pickers at Whitesbog since 1898 as a example of growers' concern for their welfare. Basic first aid was provided by Elizabeth White, and augmented by a visiting doctor. The doctor would visit twice a week, with patients paying fifty cents for care and White guaranteeing a basic fee for each visit. Elizabeth also assisted her father in defending the cranberry industry against the reformers' accusations. In early 1911 Elizabeth White wrote a seven-page letter to Jane Addams, the famous Chicago settlement house activist, to protest the NCLC's characterization of the cranberry industry. Addams was a NCLC board member. Elizabeth White's efforts to inform a fellow professional woman about the "true" conditions at the bogs reflected her important role in her father's work.[73]

Whitesbog was increasingly drawn into a national debate about child labor on the cranberry bogs. During the 1911 harvest the NCLC again visited Whitesbog and other Burlington County, New Jersey cranberry growers to conduct a follow-up study. The study was published in *The Survey* in December 1911. Expanded to include Massachusetts and slightly more moderate in tone, the follow-up study still condemned the labor system and conditions at the cranberry bogs. Because the Massachusetts bogs used primarily Portugese men picking with scoops, the situation in New Jersey with men, women, and children hand picking was still seen as worse. The article criticizes the naivete of a grower - J. J. White, although they do not mention his name in the article - who describes the cranberry harvest as "an outing in the Jersey pines." However, the article also makes a special point to mention that the housing conditions at

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[72]Lovejoy wrote: "However, as regards the condition of Italian children who were found this summer experiencing the "five weeks outing in the healthful cranberry region," I would say that the question does not appear to be whether the condition in the cranberry region is worse than the conditions of their city life, but whether it is up to the standard required by the best sentiment of the American people. Objectionable conditions in one locality cannot be justified on the ground that they are superior to those in another, and we are quite willing to co-operate with representatives of the 'Growers Cranberry Company' in submitting to the general public a full statement of the conditions revealed and leaving it to public judgment as to whether there is anything needing correction." (Letter from Lovejoy to J.J. White, 7 December 1910)

[73]Letter from Elizabeth C. White to Jane Addams, (9 Jan. 1911), Whitesbog Preservation Trust collection.

Whitesbog are "much superior" to those found at other bogs. "This year conditions have become even better, by the addition of several houses, so that the occupants of six and one-half by eight foot rooms average but a small fraction more than three persons to a room. On this bog also sanitary outdoor toilets with cement base have been erected this year."[74]

Elizabeth White met with the NCLC representatives, and furnished information about the housing at Whitesbog, but like her father criticized Lovejoy sharply for what the cranberry growers viewed as a misguided reform effort:

> It is quite possible for your Committee, through imperfect knowledge and poor judgement to damage the children you are trying to serve as it is for the Italian parents to harm the children they love through ignorance and poor judgement. Your initial moves as to the children on the cranberry bogs have been made with what appears to me as such remarkably poor judgement that I cannot furnish you with any information without grave misapprehension as to what use you will make of it.[75]

Elizabeth White emerged as an articulate spokesperson defending the cranberry industry from charges of labor exploitation. In an address before the New Jersey Conference of Charities and Correction she presented her views of Italian labor in the cranberry industry and conditions at Whitesbog. She also testified before the Commission of Immigration on this matter in June 1912, along with other local cranberry growers Clifford Budd and Andrew Rider. The two men largely followed White's lead and echoed her testimony.

White defended the healthfulness of the work, stating, "I believe there is no occupation open to illiterate, city-dwelling women more conducive to their well being and that of their children than picking berries."[76] One interesting comparison in her argument was couched in class terms, suggesting that the NCLC was attempting to impose an unrealistic middle-class standard on these poor Italian families. White wrote:

> Among the most cherished pictures in my mental gallery, is one I have so often seen in reality - a certain bog surrounded by a beach of white sand, on which literally hundreds of black eyed children revel in all the sandy pleasures enjoyed by the children of wealth at Atlantic City, while there [sic.] elders gather the red berries at a little distance. . . .For the women the advantages of this work are that

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[74]Charles L. Chute. "The Cost of the Cranberry Sauce." *The Survey* 27:9 (2 December 1911): 1284.

[75]Letter from Elizabeth C. White to Owen Lovejoy, (14 October 1911), Whitesbog Preservation Trust collection.

[76]Elizabeth C. White. "A Short Report of the Cranberry Bog Situation." read before the New Jersey Conference of Charities and Correction, Princeton, N.J., (April 1911).

> it is all in the open air, an especially fine quality of air too; that they can earn more, hour by hour, than at almost any other employment; that they can have all their children with them, and they are most loving parents, and careful so far as their knowledge goes; and that the children of seven or eight can help a little and the older ones more and more even though spending a goodly portion of the time in play.[77]

She also described the housing situation at Whitesbog quite positively: "On this bog the quarters consist of a dozen or more substantial frame houses, divided into small rooms in size and arrangement comparable to some of the first cabin state rooms on the Transatlantic liners, with enamel and upholstery omitted and a good window to open instead of a port hole to be kept closed." Occasionally a few families would be housed in a wagon shed or hay loft if the crop was especially bountiful, but White contended that a family of a mother, father, and two or three small children would have a room in the barracks, and larger families with older children would have "two or more rooms as necessary." White even secured a testimonial from a Philadelphia doctor about the good health of the Italian pickers after returning from the cranberry bogs. Perhaps the most persuasive argument was financial in spite of the NCLC protest that economics should not justify child labor. In this instance the Italian workers clearly did benefit from their agricultural migrant labor since they returned year after year. White contended that "the money earned during the summer and fall, picking other fruits and cranberries, enables these frugal Italian women to remain at home with the very little children during the winter and send the older ones to school comfortably clothed and fed."[78]

White also refuted the NCLC's implication that the padroni used clubs to threaten and beat the workers. As she explained:

> The long canes are carried by the bosses to part the vines and see if all the berries have been picked up by the pickers for where the vines are thick fully half the berries growing on the vines can be dropped on the ground and left unobserved unless the bosses pull the vines apart by these sticks. If the bosses were cruel enough to desire to use these sticks to beat the pickers, children or adults, it would be insanity on the part of the grower to permit it, he could get no pickers another year.[79]

White also suggested that if there was suitable care available for the children so their parents could avoid bringing them to the bog, it would benefit growers by saving disruption and wear

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[77]Elizabeth C. White. "A Short Report of the Cranberry Bog Situation."

[78]Elizabeth C. White. "A Short Report of the Cranberry Bog Situation."

[79]Letter from Elizabeth C. White to Miss McDougall (13 November 1913), Whitesbog Preservation Trust collection.

and tear on the vines.

During this period Gus Donato was the labor boss at Whitesbog. Elizabeth White's letters defending the Italian family labor system of the cranberry bogs also reveal the extent that J.J. White Inc. relied on Donato to provide and manage its workers. White wrote to Alexander Cleland of the NCLC in 1912: "I have no record whatever of the number of persons in the different families to which these amounts were paid but if you want it I think you can get it from Gus Donato who keeps a quite complete record of all these matters which he preserves from year to year."[80] Donato told one of the NCLC investigators that he only hired families because hiring a couple alone "pays neither of us." The padrone and family labor system for Italian immigrant workers was firmly entrenched at Whitesbog by the 1910s, although apparently implemented in a relatively benevolent fashion. Fines for rule breaking were also collected by Donato. White mentioned that $21 collected during the 1911 harvest was turned over to J.J. White Inc. The company then followed Donato's suggestion and spent the money on six oil street lamps put up at Florence. The Italian workers maintained and provided oil for the lamps. Donato received a yearly salary, while the underbosses were paid by the day. Perhaps the salary arrangement mitigated the abuse of the padrone system described at other farms and bogs.[81]

The controversy about child labor at New Jersey cranberry bogs continued with a scathing article published by *Good Housekeeping* in November 1913. The author contended that "our cranberry sauce continues to be paid for by hundreds of small, emaciated Italian children, aliens with-in our gates - paid for with their dwarfed minds, stunted bodies, aching muscles, scalding tears, and poisoned flesh." Whitesbog was named in the article as the largest bog in New Jersey, and the "best in the state, so far as conditions of operation are concerned." Elizabeth White was credited for the exceptional living conditions, but the article still roundly criticized all the New Jersey cranberry growers by stating that "even here [Whitesbog] the labor of children is permitted and paid for, and it is doubtful if it could be upheld that the conditions of picking, with their attendant physical miseries, are different from those on the average property." Certainly the sensational tone of this article in a major national magazine further incited the child labor controversy and aroused the ire of the cranberry growers.[82]

Available information seems to indicate that Elizabeth White took her father's place in leading the defense of the New Jersey cranberry industry during continued investigations. In April 1914 she gave a speech to the New Jersey Conference of Charities and correction

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[80]Letter from Elizabeth C. White to Alexander Cleland, (3 July 1912). Whitesbog Preservation Trust collection.

[81]New Jersey Child Labor Committee. Report of Cranberry Bog Child Labor Review Committee. typescript in Whitesbog Preservation Trust collection, c. 1914; Letter from Elizabeth C. White to Jane Addams, (9 January 1911), Whitesbog Preservation Trust collection.

[82]Campbell MacCollouch. "Who Picked Your Cranberries?" *Good Housekeeping* (November 1913): 675.

contrasting the NCLC reform efforts on behalf of the Italian immigrant labor with the Burlington County Colony of the Training School at Vineland, an institution for "feeble-minded" locals. Describing her years of friendly contact with both local "pineys" and Italian pickers, White characterized the NCLC's work as sensational and negative, while the Colony, supported largely by the donations of local cranberry growers, had a direct positive impact on the local community.[83] White did acknowledge regret that the timing of the cranberry harvest caused the children to miss school, but still contended that "it is generally conceded that our public schools are not ideal instruments in attaining this end [building character] and it is conceivable that a few extra weeks on the bogs may further it."[84] According to the New Jersey Child Labor Committee, White's address was widely circulated and "had a marked effect on public opinion, checking, if not halting altogether, the movement for some reasonable and moderate reforms."[85]

During the summer of 1914 the New Jersey Child Labor Committee and the Social Services Commissions of the Dioceses of Newark and New Jersey sponsored their own investigation of the New Jersey cranberry bogs. Augustine Elmendorf's findings were much more moderate than the NCLC, expressing opinions about the general healthful and desirability of an "outing in the pines" for the Italian immigrants similar those held by the Whites. He still criticized the disruption to the education of the children, but urged the Boards of Education in New Jersey and Pennsylvania to devise a flexible solution to the problem, citing the unavoidable necessity of cranberry harvest in September and October. Illustrations of picker housing in the report included small single-room shacks, and a "new type of a two-story building containing a dozen to two dozen rooms" commonly used on the larger bogs. These larger barracks could have been the housing at Whitesbog, which again was specially noted as having the best housing conditions.[86] White had acknowledged that some of the smaller bogs might have poor housing conditions, but rejected the need for federal legislation to regulate conditions at the cranberry bogs:

> I think that every cranberry grower who is in the business in the state would recognize the fact that the more decent living conditions he provides for his pickers, the better pickers he is going to procure. The man who provides the best houses will get the best pickers every time, and then I think if laws were made it

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[83]Elizabeth C. White. "Cranberries and Colony Contributions: Or the Appeal of the Colony to a Dweller in the Pines." address read before the New Jersey Conference of Charities and Correction, Asbury Park, NJ, (21 April 1914). White mentions in this speech that she recognizes one half to one third of the pictures in the various reform articles as being taken at Whitesbog.

[84]White, "Cranberries and Colony Contributions," 12.

[85]New Jersey Child Labor Committee. Report of Cranberry Bog Child Labor Review Committee. typescript in Whitesbog Preservation Trust collection, c. 1914.

[86]Elmendorf, "The Cranberry Bogs of Burlington County, New Jersey."

> would be practically impossible to enforce them, as these bogs are way back in the woods and the people do not go to them more than an average of four weeks in a season, and if these people do not like it they do not have to go again.[87]

Clifford Budd also testified about the housing conditions at his bog, which also had large barrack type houses described as the "Rome" type after one of the villages at Whitesbog. These structures were forty feet by twenty feet with a five foot entrance hall. Each room had two bunks, one four feet from the floor and the other under it. As to the family housing arrangements and degree of crowding, Budd declined to comment, stating that "the padrone takes care of the housing conditions entirely. I have never heard any complaints or anything."[88] His bog was nearly as large as Whitesbog, employing approximately 300 workers.

By 1914, the *Trenton Times* reported that the "cranberry dispute" between NCLC and South Jersey growers was finally ending. Owen Lovejoy had released a detailed letter admitting errors in the original presentation of conditions on the bogs; many were the very issues he refused to yield to J. J. White in 1910. Many, such as the exact length of work day and pace of the work, were technicalities in the face of the larger fact that children were indeed picking cranberries and missing school during the harvest, but Elizabeth White seems to have struck a bargain with Lovejoy for his apology to the growers. Elizabeth White, described in the article as the "moving spirit" of the cranberry growers' association, had apparently "predicted that if Mr. Lovejoy would issue such a statement the cranberry growers would probably appoint a committee at their next convention to confer with the child labor organizations on ways and means for bettering conditions."[89]

White created an informal committee with Mr. Rider, and George Holeman, each representing an different portion of the cranberry growing areas of New Jersey. They made several recommendations to the Cranberry Growers' Association. It was advised that pickers' houses should be one story with rooms approximately seven by seven for no more than two adults and two children under ten. These conditions were similar to those in the Whitesbog migrant worker housing at Rome and Florence. The committee also advocated weekly inspections. They also recommended a men's and women's toilet for every twenty people, situated so as not to endanger the water supply. Removing standing water and garbage around the migrant camps was advised to lessen problems with mosquitoes and flies. Although it is unlikely that all of the New Jersey growers immediately followed these recommendations, it is

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[87]New Jersey Child Labor Committee. Report of Cranberry Bog Child Labor Review Committee. typescript in Whitesbog Preservation Trust collection, c. 1914.

[88]New Jersey Child Labor Committee. Report of Cranberry Bog Child Labor Review Committee. typescript in Whitesbog Preservation Trust collection, c. 1914.

[89]"Think Cranberry Dispute Will End," *Trenton Times*, n.d., clipping in Whitesbog Preservation Trust collection.

significant that Whitesbog and Elizabeth White were basically setting the standards for cranberry picker housing throughout the state.[90]

One possible solution to the labor problem was to reduce the number of workers by switching to a scooping method of harvesting. However the good housing conditions at Whitesbog seem to have contributed to maintaining the status quo of mostly hand picking. According to Elizabeth White "to use 'scoops' to the best advantage requires an expensive raking and preparation of the bogs, which to a considerable extent destroys the possibility of a crop for the succeeding year or two. In the recent years of prosperity work other than on the bogs has been plenty, and bog owners not providing what the Italians considered proper accommodations or whose bogs were in poor condition, or who failed to work in harmony with their pickers, have of necessity resorted to scoops."[91] The scoops used were curved wood boxes on handles with a series of teeth at the front edge to comb the berries from the vines. Because the scoops were heavy and awkward, men were employed for this method, but not women and children. Newer bogs in Massachusetts and Wisconsin commonly used the scooping method while hand picking remained the preferred harvest technique in New Jersey.

In 1923 Janet McKay, a field worker for the Public Education and Child Labor Association of Pennsylvania, published her investigation of "Pennsylvania Children on New Jersey Cranberry Bogs." It had been determined earlier that Pennsylvania truancy laws could not be enforced while the children were in New Jersey, and the New Jersey government viewed the children as part of the Philadelphia school system, not subject to local control. McKay visited fourteen of New Jersey's approximately seventy cranberry bogs, including Whitesbog. Her report documented that the bog owners paid workers' train fare from the city, and row bosses oversaw groups of pickers for the padrone on the large bogs, such as Whitesbog. She also condemned the unsanitary conditions at many bogs, noting six different types of worker houses, mostly unpainted wood shanties, and a lack of cooking and toilet facilities. Apparently Whitesbog was the only bog with bakeovens and one of the few to provide a company store. At other bogs the padrones arranged for Italian bakers to come and sell bread and for Italian grocers to deliver other supplies. McKay also described the assembly or dance hall in Rome at Whitesbog as the only recreational facility provided on any of the bogs. It was described as an unpainted frame building with wooden benches around the walls.[92]

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[90]Elizabeth C. White, Report to Growers Association on labor conditions (28 August 1915), typescript in Whitesbog Preservation Trust collection.

[91]Letter from Elizabeth C. White to Everett Colby, (30 November 1914), Whitesbog Preservation Trust collection.

[92]Janet S. McKay. *Pennsylvania Children on New Jersey Cranberry Farms.* (Philadelphia: Public Education and Child Labor Association of Pennsylvania, 1923), 9. McKay mentions that the worker structures at Whitesbog are unpainted in a seemingly critical way, but the unpainted cedar siding was typical for all Whitesbog structures including the houses belonging to Elizabeth White and two of her sisters.

While the storm of protest about child labor on the cranberry bogs seemed to dissipate, changes in labor practices did occur gradually at Whitesbog. Although still reliant on a padrone, now Mike Filizione, to provide workers J.J. White Inc. posted lists of rules for the Italian migrant workers. The 1930 and 1931 lists of rules for pickers survive in the Whitesbog collection. The pickers' quarters and toilets were to be scrubbed once a week, or a fifty-cent fine would be levied. Perhaps the biggest change was banning children under eight from the cranberry bogs, and also the blueberry fields. A nursery school was established during the 1920s for the seasonal workers' children; in 1930 the parents would pay ten cents a day for the food fed to the children. Perhaps educational reforms were more feasible with the extension of the harvest season through the summer by developments in blueberry agriculture.

Whitesbog continued to take the lead in the issue of cranberry labor reform by serving as a case study for a research fellow from Rutgers University in 1930 and 1931. The research fellow, Laura Fair, was a graduate student in the School of Education at Rutgers, and a trained social worker. Her report provides a detailed account of the lives of the Italian workers at Whitesbog and the nursery school and recreational programs established for the children during the blueberry and cranberry harvests. Fair worked at Whitesbog for twelve weeks during 1930 and during the harvest season from June to October in 1931. In the winter months she visited sixty-nine of the approximately ninety-six families at Whitesbog to observe their living conditions in the city and gather data about employment and school progress. Of Whitesbog she said: "The conditions at this plantation should be taken as representing a goal toward which other growers should work, rather than as a typical example of conditions prevalent in New Jersey. The growers and the social workers realize that even these conditions are far from ideal. However, they are the best possible under present economic conditions, and the proprietors hope to effect improvements in the future."[93]

Fair worked at the nursery school or "social center" operated by the Council of Women for Home Missions in cooperation with J.J. White Inc. The Council of Women was a New York City group which founded an outreach program for migratory children in 1920. In 1930 they operated three "social centers" in New Jersey agricultural districts. The social center at Whitesbog was a "little house right in the midst of the Italian settlement. It had three rooms - a nursery, a kitchen, and a large recreation room. Here there were trained workers, often college graduates, who had a combination day nursery, nursery school, and kindergarten during the day to take care of the children under ten years while their parents are out working. At night there were clubs for the older girls and boys, who had been working in the fields during the day."[94] The younger children were taught hygiene, table manners, educational songs and games, and allowed to collect wildflowers and swim during the summer.

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[93]Laura Fair. *Migrants as a Social and Educational Problem in New Jersey.* (New Brunswick: School of Education, Rutgers University, 1931), 7.

[94]Fair, 26.

The nursery school was also given a little patch of cranberries and few rows of blueberries to care for and harvest. For a few hours each morning the children would "play" at picking, with child "row bosses," and a "bushel man" replicating the adult chain of command. According to Fair "from this child management the young pickers received very rigid instruction as to picking the vines or bushes clean, not putting in any bad fruit, and staying within his bounds. The blueberries were turned in at the sheds and the children received pay for their work, but we were allowed the keep the cranberries and make jelly of them for our lunch."[95] This vocational training for small children was not without controversy:

> We considered this wholesome recreation and exercise, good training in a vocation (Miss White says that the best and fastest pickers are the ones who learned to do it when they were children) and an aid in the development of a sense of responsibility. The children were proud to think that they were earning the money to pay for their own lunch. However, some visitors made charges of exploitation, child labor, and rearing children to be nothing more than berry pickers. So it was judged advisable to drop this activity in order that the work might not be handicapped by unfavorable public opinion. This was done much to the disappointment of the children, their parents and the teachers.[96]

In the evening hours, games and entertainment were organized for the older children. During the summer volunteers from Mt. Holly would drive to Whitesbog and help with the activities. The number of pickers grew to 450 during cranberry season. Hand picking was still the norm at Whitesbog because of the belief that scooping injured the vines. Fair's study did not find that the children were especially harmed by their staying in the country during the beginning of school. Her control groups of Italian children who attended school year all year had similar rates of failure and "retardation." She calculated that families earned from $64.19 to $509.70 for their picking work, the average being $310.19. This money was crucial to paying debts and supporting the family the rest of the year, especially because work in the city was scarce at the beginning of the Depression.[97]

White encouraged the work of the Council of Women and the Rutgers Fellowship because of the benefit to her workers. She also recognized the public relations benefit of these efforts. As she confided in a letter: "In the past I have written or spoken a few times on the status of the cranberry pickers, but anything I may say is always liable to the suspicion that my views are distorted because I am a cranberry grower. This is one of the reasons I have supported the work of the Council of Women so heartily and one of the reasons for my supporting the

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[95]Fair, 28.

[96]Fair, 31.

[97]Fair, 34.

Fellowship at Rutgers to inquire into the status of the cranberry pickers."[98]

Elizabeth White and the Four Mile Colony

Elizabeth White's humanitarianism extended beyond the migrant pickers at Whitesbog to the larger community of local "pineys." Her practical support of local efforts to provide training schools for the "feeble minded" stemmed directly from her frustration with the tactics of the NCLC in the cranberry picker situation. According to White in a 1914 address to the New Jersey Conference of Charities and Correction, "these two seemingly different subjects are closely associated in my mind and the same experience which has familiarized me with the condition of the cranberry pickers is the basis of my interest in the Vineland Colony movement." The Vineland Colony movement grew from the research of sociologist Elizabeth Kite for the New Jersey Training School for Feeble Minded Children, a private institution. Kite was hired by the Vineland Training School to trace the genealogy of several of their charges. This work brought Kite to Burlington County, where she circulated among the local population interviewing extended families and documenting the spread of "feeble-mindedness" from parent to child. White gives an account of her first meeting with Kite during the summer of 1911:

> One hot day...just as we were sitting down to dinner, one exception [to the usual approach of organized charity] knocked at the door; though when I opened it I saw only a little lady who had walked far in the heat. She took dinner with us and in the talk that followed we learned that her name was Elizabeth Kite and that she was compiling the family histories of some of the children at Vineland. She had already done considerable work in our vicinity and my mother and I were able to add to her list of names and characteristics of grandfathers and great-grandfathers, sister, cousins and aunts; for the families she was studying had been our near neighbors for generations.[99]

Elizabeth Kite's work also was sponsored by the New Jersey Department of Charities and Corrections in order to, in the words of the department commissioner, "know the sources of the contamination that is polluting the stream of our social life."[100] Kite's report recommended that state appropriations for further research identifying the feeble minded, using the Binet-Simon Measuring Scale of Intelligence "by which cases of marked defect can be reached and removed from the community" and placed into state-sponsored institutions.

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[98]Letter from Elizabeth C. White to C.M. Cheney, (13 September 1932), Whitesbog Preservation Trust collection.

[99]Elizabeth C. White. "Cranberries and Colony Contributions: Or the Appeal of the Colony to a Dweller in the Pines." read before the New Jersey Conference of Charities and Correction, Asbury Park, NJ, (21 April 1914), 15-16.

[100]Elizabeth S. Kite. *Research Work in New Jersey: Report on Social Conditions in the Pine Belt.* (Trenton: State of New Jersey Department of Charities and Corrections, 1913), 6.

When Kite published her findings in 1913, national attention focused on the seamier aspects of immorality, poverty, and inbreeding among the "pineys." Elizabeth White objected to the sensation created by popular reporting of Kite's most scandalous findings. In this context she defended the Pine Barrens community by declaring, "I am a "piney" myself, that I am not generally so classed is simply because of the degree of success my forebears [sic.] have achieved in their struggle for existence in the Jersey pines."[101] In another address she explained:

> It is this kind of people with their mussy, dirty little cabins and their unmoral doings who have been widely advertised as the typical Jersey Piney to the very great disgust and indignation of the many respectable industrious people who also have their home in the pines.[102]

White identified herself with the pines in a effort to counteract the negative public image of that region and its inhabitants.

In spite of the negative attention Kite's work brought to the Pine Barrens, White still appreciated its practical and scientific merit. She helped organize and raise money to establish a colony of the Vineland Training School near New Lisbon, to be supported with a combination of state and private funds. The Four Mile Colony was to provide training in "useful" work for people evaluated as "feeble minded," and basically, prevent them from reproducing through close supervision. Although this approach seems intrusive at best by contemporary standards, the idea here was to recognize the inherent mental disability of these individuals instead of simply criminalizing their behavior. The hands-on, "scientific" approach of the Four Mile Colony appealed to White more than what she viewed as the intrusive, muck-raking of the NCLC:

> The NCLC says "the child shall not work." This negative idea is vastly below that of the Training School which says "The child shall work in such a way and at such things as will best contribute to its own welfare and happiness and that of society."[103]

By 1916, the Four Mile Colony had been open for a year and housed thirty men.[104] Years of informal philanthropy toward her neighbors and employees had now moved White into a more

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[101]Elizabeth C. White. "Cranberries and Colony Contributions," 2.

[102]Elizabeth C. White. "The Pineys of New Jersey." read before the Nassau Chapter of the Daughters of the American Revolution, Camden, NJ (13 January 1917), 2.

[103]Elizabeth C. White. "Cranberries and Colony Contributions," 5.

[104]Elizabeth C. White. address to the Daughters of the American Revolution regents meeting, Trenton, N.J. (Winter 1916).

visible public role in Progressive-era reform efforts focused on the Pine Barrens population.

Blueberry Experiments at Whitesbog

As in all areas of her life and work, Elizabeth White favored a practical approach based upon faith in science. She explicitly connected her charitable work with the agricultural endeavors at Whitesbog.

> I think that now days God is making many revelations of his truth thru the scientific workers, and thru the practical workers too, who are fitting the bits of truth discovered by the scientists into the every day scheme of life. It is somewhat like working out an elaborate picture puzzle. . . . Every business and vocation has its place in this great puzzle picture; members of my family are working on the cranberry section and very important bits are discovered from time to time by scientists in the Department of Agriculture who are working at the same part. The last few years my attention has been especially held by the little corner of the puzzle where the blueberries fit in.[105]

Roughly concurrent with the cranberry child labor controversy and her work with Four Mile Colony, Elizabeth White was beginning an experiment in blueberry culture at Whitesbog that would result in the establishment of a lucrative new commercial crop. Like cranberry vines, wild huckleberry bushes were native to the New Jersey Pine Barrens. While cranberries prefer naturally marshy ground, huckleberries thrived in the moist, sandy soil of slightly higher areas. Elizabeth White spoke of "sampling the fruit on the huckleberry bushes which grow in such profusion on the dams and margins of the bogs" when still a school girl following her father around Whitesbog. However, wild huckleberries were available only on a limited basis. Efforts to transplant bushes and grow domesticated crops according to traditional farming methods proved ineffective. The bushes would inexplicably die shortly after being replanted. Experiments conducted by the Agricultural Experiment stations in Maine, Rhode Island, New York and Michigan all failed. Another problem was the inconsistent quality of the fruit. Elizabeth and J. J. White often discussed the possibility of cultivating the swamp huckleberries, but were discouraged by the disparate flavors and productivity of the wild bushes, and the belief that it was impossible to cultivate huckleberries from cuttings.[106]

Early in 1911 Elizabeth White saw "Experiments in Blueberry Culture"on the monthly

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[105]Elizabeth C. White. "The Pineys of New Jersey," 9.

[106]Frederick V. Coville. *U.S. Department of Agriculture Bulletin No. 193: Experiments in Blueberry Culture*. (Washington, D.C.: GPO, 1910), 11. Coville's bulletin was first issued on 15 November 1910, and reprinted on 18 February 1911. White, "Blueberry Culture," 1-2, a reference to a failed blueberry propagation experiment at the Rhode Island Agricultural Station is in Volume 1 of Entry 26 BB, Records Relating to the Blueberry Project, 1906-1929, RG54 Records of the Bureau of Plant Industry, National Archives and Records Administration, College Park, MD.

list of U.S. Department of Agriculture publications. Starting in 1906, U.S.D.A. botanist Frederick Coville had conducted a series of experiments exploring the "principles governing the growth of blueberries in common with cranberries and allied plants which differ so widely from the principles governing the growth of most agricultural crops."[107] The experiments were a revelation for Elizabeth White, scientifically explaining her intuitive understanding of Pine Barrens flora:

> To me it was the most fascinating reading for never before had I known that the soil of our bogs was acid, as was the water of our streams, that it was this which made out bog water brown, as in acid water the humus is held in solution while in alkaline waters it is deposited and the water becomes white. Never before had I known that associated with the roots of blueberry, cranberry and most other plants which grow in acid soils is a symbiotic fungus which in some still unexplained way assists these plants in obtaining the nitrogen necessary for their growth. "Experiments in Blueberry Culture" gave me an entirely new view of my old friends, the huckleberry bushes and cranberry vines."[108]

White's interest in Coville's scientific work with the U.S.D.A., an intellectual curiosity inherited from her father and grandfather, would extend the progressive nature of agriculture at Whitesbog.

A graduate of Cornell University in 1887, Frederick Coville had worked for the U. S. Department of Agriculture since 1888, and was placed in charge of the newly created Bureau of Plant Industry in 1901. In 1906 he began his blueberry experiments.[109] According to his obituary, the result of these experiments was "that large-fruited 'domesticated' blueberries, in many fine varieties, are now securely established as a profitable commercial crop in the acid sandy soils of our eastern coastal plain. Largely through his work and writing the artificial acidulation of soils and the basic requirements of the culture of acid soil plants are matters of general knowledge at present."[110]

In addition to publishing the U.S.D.A. *Bulletin*, Coville published an article in the February 1911 issue of the *National Geographic Magazine*. The editor's introduction to "Taming the Wild Blueberry," discusses the natural connection between blueberries and

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[107]Frederick V. Coville. *U.S. Department of Agriculture Bulletin No. 974: Directions for Blueberry Culture.* (Washington, DC: GPO, 1921), 1.

[108]Elizabeth C. White. "Blueberry Culture." typescript of address read before the New Jersey Horticultural Society, Burlington, N.J. (18 December 1916), 2.

[109]Frederick V. Coville. *U.S. Department of Agriculture Bulletin No. 193: Experiments in Blueberry Culture.* (Washington, D.C.: GPO, 1910), 10.

[110]"Frederick Vernon Coville," *Science* 85:2203 (19 March 1937): 281.

cranberries:

> As a result of Mr. Coville's experiments with blueberries, it is very probable that in a few years blueberries will be cultivated in the United States as extensively and profitably as the cranberry. All the blueberries now used are picked wild, just as were all the cranberries not so very many years ago.... Last year, for instance, the cranberry crop amounted to about one million and a half bushels, worth three million dollars.[111]

Coville used the name blueberry, customarily used in New England to describe the wild highbush variety with small seeds (*Vaccinium corybosum*), in contrast to a related variety with larger, crunchy seeds (genus *Gaylussacia*). In New Jersey, and other points South and West, the name huckleberry traditionally was applied to both varieties. The highbush blueberry commonly grows four to seven feet high and produces abundant berries. Coville estimated that the wild blueberry crop was worth millions of dollars every year, however previous attempts to create a domesticated crop invariably failed.

When transplanted to normal agricultural conditions, blueberry plants would die. Coville's blueberry experiments generated several important revelations that solved the problem of propagating blueberries. The most fundamental and significant of these was the importance of acidic soil. According to Coville:

> In a soil so acid that ordinary plants die of poison and starvation, the blueberry thrives, luxuriating in flower and foliage and fruit. That a plant should grow better in an acid soil than in a fertile one is contrary to what has been regarded as the one of the fundamental principles of agriculture.[112]

Another important question involved the need for nitrogen to support plant growth. Acid soil restricted the absorption of nitrogen for most plants, but acid-loving plants adapted in various ways. Coville documented that blueberries absorbed nitrogen with the help of a microscopic symbiotic fungus living in the roots of heathy bushes. Coville's experiments concluded that "the root fungus extracts nitrogenous food from the non-nitrified acid organic matter with which in comes in contact and changes it into some chemical form in which the blueberry plant can make use of it."[113] Conventional application of lime or manure to blueberry plants would interrupt this symbiotic relationship and kill the plant. Instead, the experimental blueberry plants grew best in

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[111]Frederick V. Coville. "Taming the Wild Blueberry." *National Geographic Magazine* 22:2 (February 1911): 137.

[112]Frederick V. Coville. "Taming the Wild Blueberry." *National Geographic Magazine* 22:2 (February 1911): 138.

[113]Coville, "Taming the Wild Blueberry," 139-140.

a peat mixture of decomposed oak and laurel leaves.

These conditions were readily available at Whitesbog. Although very different plants in form and fruit, the close relationship between the cranberry and blueberry made Whitesbog an advantageous location for experimentation. Before hearing from Elizabeth White, Coville wrote:

> The only fruit the culture of which bears any resemblance to that of the blueberry is the cranberry. The two plants are closely related botanically, they both require an acid soil, and they both have a mycorhizal fungus on their roots, essential apparently to their successful culture. ...cranberry culture has much of experience to offer, by way of suggestion, to blueberry culture.[114]

After reading "Experiments in Blueberry Culture," Elizabeth White wrote to the U.S.D.A. offering to assist with further blueberry experiments. Coville accepted her offer, and in March 1911 sent her seedlings from a blueberry bush he collected in New Hampshire. Through correspondence and periodic visits to Whitesbog, Coville kept White informed of his blueberry experiments.[115]

After two years of informal cooperation, in 1913 the U.S.D.A. entered into a formal contract with J.J. White Inc. to provide land and help with the cultivation of blueberry hybrids developed in Washington, D.C.. White was intimately involved in large scale blueberry experimentation at Whitesbog, including collecting specimens, propagating, and observing new hybrids. As one observer later noted:

> When Miss White began the laborious dirt farming so necessary to translate Doctor Coville's plant breeding to practical use, he had selected her as much for her lack of scientific background and pretension as for the ambition and intelligence she displayed.[116]

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[114]Coville, "Taming the Wild Blueberry," 145. Coville concluded his *National Geographic* article by saying: "I remarked to a friend that blueberry culture promised to be comparable in many respects with cranberry culture. He quite outran the idea that was in my mind by replying, 'Why, it has the cranberry beaten. You can't use cranberries without buying a turkey to eat with them.'" (147)

[115]The letter White sent to Coville is reproduced in Elizabeth C. White. "The Blueberry Grower: The 25th Anniversary of the Beginning of Blueberry Culture at Whitesbog, New Jersey, Part 1" *Cranberries* (May 1936): 14-15.

Research notebooks kept by Coville make frequent references to exchanging specimens with White, her reports on the progress of the blueberry hybrids, and visiting Whitesbog. See RG 54, Records of the Bureau of Plant Industry, Entry 26BB, Records Relating to the Blueberry Project, 1906-1929, at the National Archives and Records Administration, College Park, M.D..

[116]Philip S. Rose. "Blueberry Queen." *Saturday Evening Post* 215:11 (12 September 1942): 52; See also Coville, *U.S.D.A. Bulletin No. 974: Directions for Blueberry Culture*. (1921), 1; White, "Blueberry Culture," 2-3.

White began her own efforts to collect promising wild bushes from New Jersey by utilizing the expertise of local woodsmen, or "Pineys" as they were called. One man collected three bushes for her during the summer of 1911. Word spread and several more people marked promising bushes for White during the summer of 1912 to be transplanted while dormant. For the summer of 1913 White developed a simple, yet clever collection system. She provided local huckleberry pickers with an aluminum gauge with a 16mm hole for measuring berries, three 2 oz. jars and a formalin solution for preserving collected berries, and a wooden plant label to mark the bushes. However, widespread blueberry bush collecting had to wait until the next year as a late frost wiped out the 1913 wild blueberry crop. During 1914 approximately sixty bushes were marked. White paid a dollar for marking the bush and bringing back berry samples. Huckleberry pickers were also "liberally paid" for their time spent guiding White back to the bush. White estimated that each wild bush cost "considerably more than $5 apiece delivered at Whitesbog. She spent three weeks during November 1914 digging up dormant blueberry bushes.[117]

During 1915 and 1916, White raised both the fee and standards for exemplary bushes, requiring at least five berries on the bush that would not drop through the gauge. White's approach to blueberry experimentation was a characteristic combination of botanical knowledge and common sense. White appreciated the special skills that the local pickers brought to the federal effort to create a commercially propagated blueberry crop. Her words during a December 1916 address to the New Jersey Horticultural Society were significant:

> Here I would like to pay a tribute to the pine people who have assisted me to locate these plants. You have heard many stories greatly exaggerating their bad points the past year or two and it is but fair that you should hear the other side. The typed directions that I furnished were of very little use except as an aid in formulating my own ideas, but this was because of the readers' lack of training in that direction rather than lack of native intelligence. When we get in the woods and swamps I am the one who reads haltingly and with imperfect understanding and must rely implicitly on my piney guide.[118]

The most promising wild plants were named after their collectors. One of the best was found by Rube Leek, but neither of his names seemed suitable for a new blueberry cultivar. According to White, "Leek savors of onions and Rube did not seem an appropriate name for so aristocratic a bush." Coville suggested "Rubel," and this variety was the parent of many hybrids and only wild

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[117]White, "Blueberry Culture," 3, 5. Coville and White are widely recognized as the pioneers of a cultivated blueberry industry. See Paul Eck and Norman F. Childers, eds. *Blueberry Culture.* (New Brunswick, N.J.: Rutgers University Press, 1966), esp. 3-11.

[118]White, "Blueberry Culture," 3.

bush extensively propagated decades later.[119] Other varieties collected by local woodsmen for Elizabeth White included the Harding, Adams, Dunfee, Grover, and Sam.[120]

By 1914 the U.S.D.A. was ready to plant a field of hybrid blueberry seedlings at Whitesbog. The blueberry test fields were created from so-called savannah ground, the land between the swamps and the upland. These areas were too wet for pines and too dry for swamp cedar, instead mainly consisting of laurel bushes growing in a thin layer of peat over sand. These acidic and moist conditions were well-suited to blueberries, but the fields required preparation for organized blueberry experimentation. Small trees and brush needed to be cut and burned, and the field plowed approximately a year before planting. The field was then smoothed with a harrow several times until blueberry planting began.[121]

Cuttings from roots of the wild blueberry plants were planted in cold frames as recommended by Coville. Before the young plants could be placed in the test field, the seedlings were propagated in greenhouses and under lathscreens to provide dappled shade. The seedlings from these cuttings were planted in blueberry test fields created at Whitesbog; there were four fields by the end of 1916. White tracked the progress of the seedlings and discarded many plants due "susceptibility to spring frosts, others because of disagreeable flavor, poor texture of the fruit, undesirable habit of growth or some other objectionable characteristic."[122] White recalled in 1936:

> Size of berry was the obvious quality on which to base the first selection of wild blueberry bushes, but we early learned that many other qualities are of equal or greater importance. Good flavor and aroma we must have. Equally important is fine texture. The very large berries of some varieties were found to have tough skins and weak, watery pulp. Others were mealy in texture, or would crack open when it rained. Some tore badly when picked. So it came about that many varieties which at first seemed promising had to be discarded - thousands upon thousand of bearing bushes dug up and burned.[123]

White also observed the impact of a number of other conditions on the blueberry bushes such as irrigation and drainage, fertilization, and insects.

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[119]Elizabeth C. White. "Taming Blueberries." typescript of radio address for the Radio Garden Club, New Brunswick, N.J., (6 July 1937), 2.

[120]Elizabeth C. White "The Blueberry Grower: The 25th Anniversary of the Beginning of Blueberry Culture at Whitesbog, New Jersey," *Cranberries* (June and July 1936).

[121]White, "Blueberry Culture," 5.

[122]White, "Blueberry Culture," 5.

[123]White, "Taming Blueberries," 2-3.

In June 1916, Coville published another article in the *National Geographic Magazine*, "The Wild Blueberry Tamed: The New Industry of the Pine Barrens of New Jersey." He described the trial-and-error process of discovering the best methods of rooting blueberry cuttings and the importance of the "New Jersey plantation" to his follow-up experiments. For example, the caption for a photograph of a three-year-old blueberry hybrid described the plant as a hybrid between two wild bushes, one from Greenfield, New Hampshire and the other from Browns Mills, New Jersey. The plants were created in a Washington, D.C. greenhouse during 1912 and then transplanted to Whitesbog early in September 1913. Further experiments also indicated that blueberry bushes needed to be chilled and go dormant during the winter to replenish themselves for vigorous spring growth.[124]

By 1918, fifteen acres of blueberry test fields had been developed at Whitesbog. Elizabeth White described the early output of these experimental fields at a meeting of the New Jersey State Horticultural Society:

> To date we have about fifteen acres planted, eight of which may be expected to produce more or less fruit next summer; of this, the oldest piece of any uniformity is a lot of about 1075 seedlings which were planted in the field in September of 1913, when they were one year old from seed. Spaced four feet apart in rows eight feet apart they would occupy about 4/5 of an acre....In 1918, the fifth summer in the field, we picked 585 quarts which sold for 30 cents a quart. ...it should be remembered that these plants are seedlings from selected wild parents, and while the average quality is much above that of an equal number of wild plants it varies enormously....Crosses of these have been made, but as yet have not yielded fruit....We also have great improvement in flavor and texture over the average wild berries with prospect of even finer quality.[125]

The experimental fields were starting to yield results, but White was still carefully monitoring and eliminating poorly performing bushes to develop the strongest ones.

The work at Whitesbog not only gathered information for a lucrative new crop, but provided the plant material to spread the commercial production of domesticated blueberries. During the early 1920s, J.J. White Inc. issued a small brochure entitled "An Experimental Farm in Miniature." The brochure stated "now, after years of trial and tribulation with wild plants, and

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[124]Frederick V. Coville. "The Wild Blueberry Tamed: The New Industry of the Pine Barrens of New Jersey," *National Geographic Magazine* 29:6 (June 1916): 543-544. For another early description of the blueberry experiments at Whitesbog see H. W. Collingwood. "The Blueberry Lady," *Country Life in America* (September 1916): 38-39.

[125]Elizabeth C. White. "What Berry is Worth More Commercially in the United States Than all the Other Berries Combined?" typescript of response to question at the meeting of the New Jersey State Horticultural Society, at Atlantic City, New Jersey, (2-4 December 1918) in Whitesbog Preservation Trust collection.

subsequent experiments with the cultivated specimens developed from them, we feel our distinct varieties are well worth while. Each of them produces...delicious berries, all of good size, and with small, insignificant seeds." In addition to detailed information about the cultivation of blueberries, the brochure explained the need for further testing to see how the cultivated blueberries bushes grew in different areas. Two hundred sets of test plants were available that year. Interested parties could send $3 to J.J. White Inc. under the "Try and Report" plan, and receive three blueberry bushes. This "experimental farm in miniature" would include one each of the Harding and Rubel varieties developed at Whitesbog. These two varieties were the first named plants ever planted in alternating rows; in 1917 White planted six rows of Rubel and four rows of Harding. Buyers were asked to periodically report on the progress of the blueberry bushes planted in different parts of the country.[126]

Around 1920, White again increased both the price and the standards for exceptional wild blueberry bushes. She issued a detailed pamphlet with "$50 Offered for a Blueberry Bush" on the cover. The pamphlet explained the blueberry experiment and the cooperation between Coville and White:

> Since his first blueberry bulletin was published, Mr. Coville has continued working out the scientific problems of blueberry culture in the Government greenhouses at Washington, and cross breeding the best wild plants that he could get, many of which have been supplied by Miss White....Miss White has been trying out these seedling plants near New Lisbon and growing and propagating the best wild plants. She has learned how to cut wild blueberry bushes into little pieces and start new plants from the cuttings. For this purpose and to supply Mr. Coville with new material for his breeding work, Miss White now wants more especially fine wild bushes...It is especially desired to secure the best plants from parts of the United States at a considerable distance from New Lisbon; because it is to be expected that better results will be obtained by crossing two plants from distant parts of the country than by crossing two from the same neighborhood.[127]

The bush needed to have at least three or four berries three-quarters of an inch in diameter, or the size of a penny. White offered to pay for shipping of any superior blueberry bush properly marked and shipped to Whitesbog with a notarized affidavit confirming that it was the source of

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[126]Elizabeth C. White. "The Blueberry Grower: The 25th Anniversary of the Beginning of Blueberry Culture at Whitesbog, New Jersey, Part 5" *Cranberries* (September 1936): 15. A February 1946 *Horticultural News* article described these rows as still standing east of the house. Today rows of blueberry bushes are still partially extant in the woods east of Suningive. Someone knowledgeable about blueberry varieties could confirm whether these bushes are Rubel and Harding. "The Experimental Farm in Miniture" brochure is in the Whitesbog Preservation Trust collection. It is not dated, but another copy of the photo of Coville on the cover is dated 1920.

[127]Pamphlet in Whitesbog Preservation Trust collection. White also offered no less than $25 for bushes with smaller berries of superior taste and texture.

the berry samples.

In October 1921, Coville published a U.S.D.A. bulletin entitled "Directions for Blueberry Culture." By that time sixteen acres of blueberry test fields had been developed at Whitesbog, with 27,000 different hybrid seedlings. Of these, "18,000 hybrids have fruited and four of them have been selected and approved as worthy of introduction in agriculture." Coville also commented that "Miss White has also brought together at Whitesbog a very remarkable collection of selected wild blueberry plants. Several of these have been used as breeding stocks in the blueberry development work carried on by the department." This bulletin was intended more as a practical guide to commercial growth of blueberries, so Coville supplemented his scientific information with practical recommendations about blueberry cultivation. According to Coville, "one of the most promising districts for blueberry culture is the cranberry region of New Jersey, for these an ideal soil occurs in conjunction with an early-maturing season and excellent shipping facilities to the markets of Philadelphia and New York."[128]

Coville's paper also provides insight into the blueberry propagation methods used at Whitesbog. Although Coville describes budding, stumping, and tubering as methods of propagating blueberries, it appears that the tubering method was used at Whitesbog. Tubering involved making stem cuttings of blueberry bushes while they are dormant from fall to early spring. Three or four inch pieces were covered with a mixture of sifted rotted peat and sand, and kept between 55 to 65 degrees Fahrenheit and moist to encourage new shoots. Coville explained:

> At Whitesbog the process of tubering has been carried on with great success in muslin-shaded cold frames, and the handling of the cuttings, both before and after rooting, has been such [sic.] simplified. The cuttings are made in the fall, packed in boxes in loose, moist, clean sphagnum moss or basswood sawdust, and stored during the winter in a cool cranberry house at a temperature of about 40 degrees Fahrenheit. As soon as the frost is out of the ground beds of clean sand are laid down in the cold frames and the cuttings are pressed into the sand until the upper side is level with the surface. The whole is then covered with an inch layer of sifted peat (about two parts) and sand (one part). At first the frames were completely shaded by clean white muslin on a framework about seven feet above the ground. They are given a small amount of ventilation.[129]

Coville mentions an experiment using lath instead of muslin to shade the cuttings in 1919 and 1920. Later photographs indicate that lath became the preferred material; Coville mentions that it was potentially less expensive and easier to handle than muslin.

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[128]Frederick V. Coville. *U.S. Department of Agriculture Bulletin No. 974: Directions for Blueberry Culture.* (Washington, D.C.: GPO, 1921), 2-3.

[129]Frederick V. Coville. *U.S. Department of Agriculture Bulletin No. 974: Directions for Blueberry Culture.* (Washington, DC: GPO, 1921), 11-12.

Caring for the bushes after they were established in the field was also described. Charles Beckwith with the New Jersey Agricultural Experiment Station experimented with applying acidic fertilizers to blueberry bushes at Whitesbog. Fertilizing was done only in areas with soil with a high sand and low peat content. These bushes performed as well as those planted in optimal soil with naturally occurring peat. Pruning methods were also tested at Whitesbog: "With lowbush hybrids it has been found desirable at Whitesbog to remove each year, in late July or early August, immediately after the picking season, all the stems more than one year old which have not made vigorous new twig growth during the season."[130] Also selected bushes were covered with cheesecloth for close observation and controlled pollination.

Coville also discussed the potential value of a blueberry crop as demonstrated at Whitesbog. In 1915 Whitesbog blueberries earned $37 per acre; by 1920 they earned $1,280 per acre. The hybrid blueberry bushes at Whitesbog were yielding berries three-fours of an inch in diameter, Concord grape-sized berries in contrast to the pea-sized berries commonly found on wild bushes. Harvesting Whitesbog's crop cost approximately six cents a quart in 1920 with the average picker picking about a bushel a day. Each quart was worth about 34 cents. Coville cautioned that blueberries should be picked by hand, "never with a 'rake' or 'scoop,' such as is used when blueberries are carted direct to commercial canneries."[131]

Coville summarized the significance of the development of the domesticated blueberry as a "much more profound...than the mere addition of one more agricultural industry to those already in existence. Blueberries thrive best in soils so acid as to be considered worthless for ordinary agricultural purposes."[132] For Whitesbog, Elizabeth White's initiative placed J.J. White Inc. at the genesis of a new crop uniquely suited to Pine Barrens conditions. Blueberries would not compete with cranberries for space and labor, but instead expand the cultivated land and harvest season at Whitesbog. The blueberry fields were best located in slightly higher land unsuitable for cranberry bogs. Wetter areas also could be modified for blueberry growing by installing tile drains eighteen to twenty-four inches deep, or "throwing up slight ridge with a plow and planting the bushes on these ridges."[133] The blueberry harvest was in July and August, providing a useful extension to the fall harvest season for cranberries. Caring for the blueberry plants and running the nursery also provided additional work at Whitesbog. For example, in 1925 blueberry plant pruning was begun in late winter and early spring by men employed year-round by J. J. White, Inc. and then continued for four weeks by a group of Italian women who

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[130]Coville. *Directions for Blueberry Culture.* (1921), 21.

[131]Coville. *Directions for Blueberry Culture.* (1921), 23.

[132]Coville. *Directions for Blueberry Culture.* (1921), 24.

[133]J. J. White, Inc. *Whitesbog Blueberry Notes.* (Whitesbog, N.J.: J. J. White, Inc., 1 December 1926).

came to Whitesbog around April 1st.[134] In New Jersey, the growth of the commercial blueberry industry looked quite promising. State cranberry specialist Charles Beckwith predicted in *New Jersey Agriculture*:

> The cultivated blueberry will replace the wild blueberry in the markets of the country because of its superior size, flavor and ability to stand shipping. The initial cost is great, but the profits to be derived appear to be correspondingly high.[135]

Another widespread innovation initiated by White during the early 1920s was packaging quarts of blueberries with cellophane. The first quarts shipped in 1916 were covered with brown paper. Starting in 1917 thick paper covers printed with the Whitesbog Blueberry name were used. A few years later Sidney Hutton, one of White's assistants, saw a candy box wrapped with clear plastic. The candy company shared the name of its supplier with a noncompetitor, and the first cellophane coverings for quarts of blueberries were imported from Europe. Having a transparent covering over the perishable berries was an important marketing tool which would later become common in the food industry.[136] By 1925 the first-grade blueberries grown at Whitesbog were covered with cellophane labeled with a Whitesbog Blueberries seal for sale in New York City. Second-grade berries had brown paper covers with the Whitesbog trademark and third-grade berries were covered with gray paper and sold as Star brand to avoid negative association with Whitesbog.[137] White also founded a national marketing association for blueberry growers in 1927, the Blueberry Co-operative Association. The Association was modeled on the Cranberry Growers Association started by her grandfather, and marketed blueberries under the trademark Tru-Blue-Berries. This organization and the Tru-Blu brand is still in existence today.

In addition to selling the blueberry crop, White launched an important nursery business in blueberry plants. A 1923 circular distributed by the "Whitesbog Blueberry Nurseries" of J. J. White Inc. promoted blueberry bushes for both commercial and ornamental use. The company would sell blueberry bushes to interested parties with the claim that the fully grown sections of the Whitesbog blueberry fields were producing a crop worth an average of $800 to $1000 an

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[134]Sydney B. Hutton. "Blueberry Report for Year 1925," submitted to Joseph J. White Inc., (30 January 1926). This report is in the Whitesbog Preservation Trust collection and contains detailed information about fruit production, care of the fields, marketing efforts, and the blueberry plant nursery and sales.

[135]Charles S. Beckwith. "Blueberry Growing Proves a Paying Industry for South Jersey," reprint from *New Jersey Agriculture* (June 1923).

[136]Elizabeth C. White. "The Blueberry Grower: The 25th Anniversary of the Beginning of Blueberry Culture at Whitesbog, New Jersey, Part 4," *Cranberries* (August 1936): 18.

[137]Sydney B. Hutton. "Blueberry Report for Year 1925," submitted to Joseph J. White Inc., (30 January 1926).

acre. The cooperative experiments of Coville and White were credited with creating a demand for cultivated blueberry bushes that exceeded the supply. A 1923 article in the *San Francisco Examiner* even reported that "unscrupulous dealers are said to be selling inferior wild blueberries for grafted hybrids of high quality."[138] As described later in the *Saturday Evening Post*:

> ...growers who had seen the new blueberries and heard of their success in the markets flocked to Miss White to obtain bushes for themselves. She had all of the named varieties and the skill to propagate young plants, and had no alternative but to launch Whitesbog in the nursery business. Since that time it has been headquarters for most of the nursery stock for the entire country.[139]

The Whitesbog Blueberry Nurseries circular also stated "Whitesbog blueberries not only lengthen and complete the berry cycle, but make beautiful garden ornaments." This attention to the ornamental qualities of the blueberry suggested White's later accomplishments in creating an display garden of native plants around her house and cultivating native hollies and Franklinia. White later promoted the ornamental qualities of the blueberry with characteristic poetic language:

> Every season brings special and unusual beauty. In spring, the dainty foliage and great clusters of snowy white flower bells, suggesting those of the Lily-of-the-valley, unfold at the same time. ...Summer beauty reaches its peak when the clusters of fruit are ripening 'just like grapes,' as nearly every visitor says. The laden bushes are glamorous with fruit showing lovely cool tones of frosted green, pink and blue against the deep green foliage. Autumn brings to none of our trees or bushes more brilliant reds than to blueberries, and when hard freezing takes away the fullest blaze of the foliage the color does not fade to ashen gray, for the bark of the twigs is bright all winter. Seen from upper windows during December, January, February, and well into March, blueberry fields are marvels of beauty, acres of soft deep crimson against a background of dark green pines and tawny oaks still holding persistently their brown leaves. A blueberry hedge near my office window is a joy all winter long. Its red twigs catch and hold myriads of raindrops, pearly under cloudy skies. Again, the red branches gleam warmly through sleety armor, or uphold feathery fluffs of snow.[140]

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[138]O. H. Barnhill. "Growing the Blueberry, Queen of the Small Fruits," *San Francisco Examiner* (22 July 1923).

[139]Philip S. Rose. "Blueberry Queen." *Saturday Evening Post* 215:11 (12 September 1942): 55. The Whitesbog Blueberry Nursery circulars are found in the Whitesbog Preservation Trust collection.

[140]Elizabeth C. White. "Taming Blueberries." radio address for the Radio Garden Club, New Brunswick, NJ, (6 July 1937), 3-4. See also Gove Hambidge. "She Makes a Handsome Living Growing Blueberries: The Story of Elizabeth C. White." *Success Magazine* (October 1927): 38-40, 103-104.

Marketing of the blueberry bushes continued in 1924 with a circular featuring a cover photograph of a plump cluster of Rubel variety blueberries labeled "Whitesbog Blueberries - 'Jewels of the Moorland'." A profile of White subtitled "How a Woman with an Idea Transformed the Wild Blueberries of the Marshes Into an Aristocrat Among Fruits" emphasized her contribution to the blueberry experiment. The circular offered Rubel, Harding, Sam, Grover, and Adams wild cultivars, and Coville hybrids Pioneer and Cabot at prices from $1.60 to $2.00 a bush. Testimonials from New Zealand, Long Island, Massachusetts, Minnesota, Wisconsin, and Washington State attested to the broad reach of Elizabeth White's efforts to promote blueberry agriculture.

Construction of Suningive

Whitesbog was officially given a third-class post office in 1923 because of the large volume of mail associated with the blueberry experiments. The new general store/post office building was built at this time. Also after commuting from New Lisbon like her father for almost thirty years, Elizabeth White moved to Whitesbog to more closely supervise the blueberry endeavors. Her house was built on the far eastern edge of the main village during 1922-23 (See site plan drawings, photographs, and short history for Suningive, HALS No. NJ-1-A). Called Suningive, the house was located at the site of her original blueberry test field on the edge of one of the old Fenwick bogs. When construction of the house began, the site had been an experimental blueberry field for ten years. White described the Suningive site as "bare, cultivated ground." Active blueberry experimentation had been moved to another area, but many bushes remained on the Suningive site. One row of blueberries with attractive foliage, but unimpressive berries determined the location of Suningive. This row was allowed to form a hedge. According to White, "between the hedge and the prospective porch a driveway was left. When we drive in of a winter night it reflects the light of our lamps with a rosy glow, suggesting a warm welcome. From nearby windows we enjoy the red winter twigs hung with pearly raindrops or sparkling with hoar frost."[141] The site also overlooks one of the oldest cranberry bogs at Whitesbog, which dates to the mid-nineteenth century. Elizabeth White arranged Suningive to take advantage of the view across the bog:

> The cranberry bog would serve as lawn. It had been started by my grandfather, had furnished the means for Suningive, and inspiration for its garden. For 100 acres from the windows it stretches to the distant, dark, encircling rim of pines. Its velvety surface, green in summer, gradually turns to deep maroon by the middle of October. In December the bogs are flooded and, for garden purposes, lawn becomes lake - deep blue beneath clear skies; flashing with diamonds on sunny days; dark and glowering, with white caps racing before an easterly storm wind; smooth, still, and

[141]Elizabeth White, "My Garden of Pine Barrens Plants," (typescript of address on Radio Garden Club, 24 March 1941), Whitesbog Preservation Trust collection, 1.

shining when Jack Frost lays his quieting hand upon it.[142]

The house is a simple two-and-a-half story structure with architectural details inspired by the Arts and Crafts movement. Suningive was custom-designed, perhaps by White herself, as living and work space connected to the surrounding landscape. Offices and a garage occupy the ground floor, while the main living spaces are on the elevated first floor. Additional bedrooms occupy the finished attic story. In location and design, Suningive represents White's lifelong career at Whitesbog and her intimate connection to the local Pine Barrens landscape.

Elizabeth White's interest in native plants extended from the crops of cranberry and blueberry to ornamental plantings well-suited to the sandy, acid soil of the New Jersey pines. She had learned about the unusual properties of acid soil from Coville's research on blueberries and she combined this scientific knowledge with her over thirty years of personal observation to create an unique Pine Barrens botanical garden around her home. Some clumps of native trees such as pines, cedars, red maples, gray birches, sourgums, and swamp magnolias remained on the edges of the bog and test field, as well as shrubs such as clethra, swamp azalea, aronia, and inkberry. As stated by Elizabeth White in 1941:

> Such success as this small naturalistic garden has attained has grown out of an effort to blend as unobtrusively as possible the necessary conveniences of living, such as drives and paths, the straight ditches and other artifices of modern cranberry culture, and the encompassing Pine Barrens country, with its special and peculiar charm.[143]

The overall character of the site was very sunny and open, with very flat terrain sloping very slightly toward the bog to the south and the pond/wetland area created to the west.

Thus by the late 1920s blueberry work at Whitesbog was shifting from the intense experimental phase of the early years to commercial development of the crop. Coville and White's partnership ended in 1928 for unclear reasons. According to White "this cooperation closed when the new responsibilities falling on me after my father's death and the growing claims of blueberries as a commercial crop made it impossible for me to give the close personal attention to co-operative experiments, which characterized the earlier years of the work."[144] The

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[142]Elizabeth White, "My Garden of Pine Barrens Plants," 2.

[143]Elizabeth White, "My Garden of Pine Barrens Plants," 5.

[144]Elizabeth C. White. "The Blueberry Grower: The 25th Anniversary of the Beginning of Blueberry Culture at Whitesbog, New Jersey, Part 5," *Cranberries* (September 1936): 14. White also mentions in this article that she was available to work on the blueberry experiments because her brother-in-law Frank Chambers was in charge of J.J. White Inc.

volume of production and organization achieved by the 1930s changed the nature of blueberry growing at Whitesbog. Consistency was now of utmost importance, making "the old fields of miscellaneous hybrids, where no two bushes produce berries of exactly the same color, size, shape or flavor, have become a liability instead of an asset."[145] In 1936, 600,000 quarts of blueberries were sold by Blueberry Co-operative Association members including Whitesbog. In 1928 White also started her own breeding project, probably to supply the continuing demand for known variety blueberry bushes. In 1945 she was working to breed more early producing blueberry varieties.[146]

White's fame as a pioneer blueberry grower continued to spread, particularly through a 1942 *Saturday Evening Post* profile entitled "Blueberry Queen." In addition to recounting the history of Whitesbog and Coville and White's blueberry experiments, this article described the current Association procedures and harvest at Whitesbog. Association members were in New Jersey, Michigan, and North Carolina, with the largest percentage of berries coming from New Jersey. Association members accounted for ninety-percent of the commercial blueberry crop. Tru-Blu-Berries were labeled by grade - Crown was the highest with more than ninety berries to the half pint, Harvest Moon had ninety to 130 berries, and Green Label had 130 to 190 berries. Mechanical sorting damaged the berries, but was largely unnecessary because of consistent size of berries from each bush variety. Early, mid, and late-blooming varieties extended the blueberry harvest at Whitesbog from mid/late June to August. Each bush needed three or four pickings as the berries gradually ripened. Pickers earned five and a half cents a quart plus bonuses; a good worker could earn five to six dollars a day. Forewomen, usually teachers on summer break, provided quality control by looking for green or torn berries before punching the worker's tally card. Early season berries earned seventy-five cents a quart; the price dropped to thirty-three cents as the market became saturated at the height of the harvest.[147]

Elizabeth White's Pine Barrens Garden

After her success with the blueberry and the construction of Suningive, White expanded her professional horticultural interests to domesticate other native species and experiment with other acid-loving plants. She utilized the blueberry propagating frames and greenhouses, and the Suningive site to work with acid-loving ornamentals, particularly American holly. Coville's blueberry research notebooks indicate that he was also interested in native Pine Barrens species and other acid-loving plants such as Franklinia. Franklinia was a rare, magnolia-like bush first collected by Philadelphia botanist John Bartram in the eighteenth century and now extinct in the

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[145]Elizabeth C. White. "The Blueberry Grower: The 25th Anniversary of the Beginning of Blueberry Culture at Whitesbog, New Jersey, Part 5," *Cranberries* (September 1936): 14.

[146]Elizabeth C. White. "Taming Blueberries." radio address for the Radio Garden Club, New Brunswick, NJ, (6 July 1937); J. Harold Clark. "Miss Elizabeth White is a Horticultural Pioneer." *Horticultural News* 27:2 (February 1946): 1801.

[147]Philip S. Rose. "Blueberry Queen." *Saturday Evening Post* 215:11 (12 September 1942): 19, 55.

wild. During the late 1910s and early 1920s, Coville and Elizabeth White often exchanged specimens, such as when Coville sent her some Franklinia seedlings, and White sent him samples of the tiny Pine Barrens Gentians plant. After their working relationship ended in 1928, Elizabeth continued to experiment with acid-loving ornamentals. A Whitesbog Blueberry Nurseries advertisement in *Nature Magazine* with the heading "A Fall-Blooming Tree of Unmatched Charm" offered 27 to 33-inch high Franklinia specimens for $7.50.[148]

In spite of the fact that holly is strictly an ornamental plant, White approached her work with *Ilex opaca* much like her blueberry experiments. Through careful propagation and observation beginning during the late 1920s, White promoted the particular characteristics of a number of different American hollies. She described the objective of her work with holly as:

> Primarily the conservation of our native holly. For twelve to fifteen years I have been working on the problem of providing holly plants so good that gardeners can easily grow and enjoy this most beautiful of Christmas trees. This should discourage further devastation of the native stands.[149]

Correspondence between White and Wilfred Wheeler, former Massachusetts Commissioner of Agriculture, described White's work with holly in the late 1930s and early 1940s. While both of them were collecting promising wild specimens, Wheeler relied on White for her expertise in choosing, transporting, and propagating promising varieties. In 1941, Wheeler wrote:

> I am indeed glad you think I have encouraged you in your holly work. It is such a pleasure to work with you, for I feel like an amateur compared with what you know. I have learned so much from you about what to look for in hollies. I find myself looking for the things you have spoken of and being very hard-boiled over a tree which does not have these qualities.[150]

In 1941, White had over 15,000 holly seedlings, one to four feet high, for promoting the use of

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[148]*Nature Magazine* 15:2 (February 1930): 117. Numerous brief references to plant exchanges between Coville and White are found in the six bound volumes of Coville's research notes in Entry 26 BB, Records Relating to the Blueberry Project, 1906-1929, RG54 Records of the Bureau of Plant Industry, National Archives and Records Administration, College Park, M.D.. For example White sent Coville a female *Gentiana porphyric* from the New Jersey Pine Barrens on October 30, 1917.

[149]Transcript of Radio Interview About Holly, Elizabeth C. White. (10 October 1941), typescript in Whitesbog Preservation Trust collection.

[150]Dorothy Ebel Hansell, ed. *On Holly: From Letters between Elizabeth C. White and Wilfred Wheeler* (Holly Society of America, 1968), 31 (letter dated 19 November 1941). In a letter to Wheeler dated 11 September 1942, White mentioned that "our holly house was burned after Christmas 1935." She also mentioned that "as the holly nursery is located on an old cranberry bog, the small plants are more likely to have the blossoms injured by frost than if I were able to have them on higher ground" (48).

domestic holly in landscape plantings and for holiday decoration. She collected and propagated cuttings from hollies growing wild in wooded areas, or near "old New Jersey homesteads." She observed, and then named the best of these found varieties, like her work with wild blueberries. For holly the shape and color of the berries and evergreen leaves, and other habits such as bushiness or abundant berries were important ornamental qualities to be considered. White hoped to someday "have a strain of wild holly developed for hedge, another type for field planting and...small holly bushes in pots, covered with red berries for the Christmas trade."[151]

Suningive served as a laboratory for this work, with several specimen holly trees planted by White on the site. White mentioned to Wheeler the birds eating the berries from a small holly near her house before Christmas every year. A 1942 *Saturday Evening Post* profile of Elizabeth White and her blueberry work noted the unusual hollies in the gardens around White's home. She promoted the beauty of native Pine Barrens plants through articles and speeches, and experimented with propagation and sale of seedlings to promote conservation, although wartime labor shortages did slow White's holly work.[152]

J. J. White Inc. included Whitesbog Conservation Nursery, selling blueberry, holly, Franklinia, and other native plants throughout the country. By 1953 Elizabeth White had collected, propagated and named over thirty-five American holly (*Ilex opaca*) varieties and at least one *Ilex glabra* variety ("Bronze"). Varieties such as Farage, Isaiah, and Mae were propagated from wild hollies found around Whitesbog.[153] White founded Holly Haven to sell holly and other native plants, a commercial nursery located just east of Whitesbog along present day Route 70. The corporate relationship between Holly Haven and J. J. White Inc. is unclear, but it is likely that friction between White and other family members instigated the creation of Holly Haven as an entity separate from J. J. White Inc.. Sydney Hutton, who assisted with the blueberry experiments, managed White's commercial nursery.[154] A mail order form for Holly Haven touted Elizabeth White's international fame as "the Pioneer Blueberry Grower" and promised that:

> Legions of American Holly clones have been tested at Whitesbog for many years. From these, Miss White has chosen the very best for beauty of form and

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[151]Philip S. Rose, "Blueberry Queen," *Saturday Evening Post* 215:11 (12 September 1942): 55.

[152]Hansell, 77 (15 November 1944); Philip S. Rose, "Blueberry Queen," *Saturday Evening Post* 215:11 (12 September 1942): 55. In a 16 October 1944 letter to Wheeler, White complained that she had not been able to put in any holly that year because of coal and labor shortages. See Hansell, 71.

[153]H. Harold Hume. *Hollies* (New York: The Macmillan Company, 1953), 47-66, 112-113. The cultivar Isaiah was named for a "man at Whitesbog," J.J. White Inc. superintendent Isaiah Haines. Hume also mentions a good specimen of a Clark hedge at Whitesbog (196). Fred C. Galle. *Hollies: The Genus Ilex* (Portland, O.R.: The Timber Press; Holly Society of America, Inc., 1997), 365.

[154]Darke, 42.

> foliage...for reliable fruitfulness...for hardiness...for best colored berries. Now you can have, at modest cost, the choicest of American Hollies, proven by time, chosen personally by Miss White, a holly expert.[155]

Holly Haven sold a number of American holly (*Ilex opaca*) varieties including Clark, suitable for hedges, and Betsy, a fast growing type with dark foliage and abundant, bright berries. Also available for sale was Chinese holly (*Ilex cornuta burfordi*) and black berried hollies desirable for their smooth, evergreen foliage such as *Ilex crenata* and Inkberry (*Ilex glabra*).

Elizabeth White was active in the formation of the Holly Society of America in 1947. According to a recent volume sponsored by the Holly Society, "in the 1930s an unknown number of people in the Northeast were interested in hollies, although they were unaware of others who shared their interest in their own and adjacent states."[156] At this time wild stands of American holly in Massachusetts, New Jersey, Maryland, and Virginia were being stripped of branches for holiday decorations. In 1944 Elizabeth White and Earle Dilatush of Robinsville, New Jersey met with U.S.D.A. employees and encouraged formation of a Maryland Holly Society. That same year a New Jersey Holly Research Committee was created which included Elizabeth White. In 1947 the two organizations combined to form a national Holly Society of America. White served on that organization's Arboretum Committee and the Variety Selection Committee from 1947 until her death in 1954. Elizabeth White and Holly Haven were listed as sources for holly in the association bulletins during this period as well. By the early 1950s, White was acknowledged as one of the early pioneers of holly propagation and orcharding, as well as Earle Dilatush, Wilfred Wheeler, and Clarence W. Wolf. White worked closely with each of these men; Dilatush and Wolf were also located in New Jersey, with Wolf operating the New Jersey Silica Sand Co. Orchard in Millville, New Jersey, a world-famous private orchard of American holly. Commercial harvest of holly orchards helped supply the holiday demand for the decorative greens without depleting the wild holly supply. Cultivars 'Elizabeth' and 'Miss White' were named in her honor by Wilfred Wheeler and Clarence Wolf, respectively.[157]

J. J. White Inc. and the Cranberry Industry

As Elizabeth White was becoming more deeply immersed in blueberry, holly and other research, she became less involved with the cranberry operations of J. J. White Inc. Frank Chambers, husband of J. J. White's youngest daughter Ann, served as vice-president of J. J. White Inc. starting in 1915. Chambers was a professor of mathematics at the University of Pennsylvania, and essentially managed Whitesbog part-time until 1945. Superintendent Joseph

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[155]Holly Haven, Inc. brochure, Whitesbog Preservation Trust collection.

[156]Galle, 493.

[157]Hume, *Hollies*, 218, 206; Galle, 494; Cite the volume of bulletins at UMD, Holly Society Bulletin, 1947-1959.

Haines lived at Whitesbog and took care of daily operations starting in 1917.[158]

After decades of expansion cranberry acreage in New Jersey decreased steadily starting in the 1920s. During that decade growers experienced serious problems with false blossom disease, which made the vines unfruitful. It was not until 1929 that the leafhopper insect was identified as the cause of the disease. Several years of drought from 1929-31 also encouraged rapid abandonment of low yielding acreage. Elizabeth White responded to the crisis by calling for more research on cranberry varieties by the American Cranberry Growers' Association in cooperation with state and federal agencies. She recalled traveling to Massachusetts with her father to obtain the best Howe cranberry vines on Cape Cod in the 1890s and suggested that new varieties and methods were needed to combat false blossom disease and grow cranberries more suited to modern canning methods.[159] From 1931 to 1945 bearing cranberry acreage in New Jersey decreased 29 percent, although cranberry production remained relatively stable at 85,000 barrels annually. Burlington County remained a major cranberry area, producing 68 percent of the state crop in 1955.[160]

Although more cranberries could now be produced on less acreage, decreasing the size and number of cranberry growers in New Jersey, blueberry agriculture grew tremendously in the forty years after its introduction by Coville and Elizabeth White. In 1935 there were fifty-three blueberry growers in New Jersey. In 1956 that number had increased to 545. Burlington County, and especially Pemberton Township where Whitesbog is located, had the most extensive amount of blueberry agriculture. Of the 545 statewide growers, 306 were in Burlington County. Atlantic County's blueberry agriculture also developed rapidly in this period, with the second highest number of growers. Blueberry agriculture emerged in the same areas as cranberry bogs, although blueberries required slightly higher, drier land.[161]

Larger changes in the harvest and processing of cranberries had a major impact on changes at Whitesbog by the 1940s and 1950s. Starting in the 1930s the preferred harvest

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[158]Bolger et. al. 50-51.

[159]Elizabeth C. White. "Discoveries." read before the annual convention of the American Cranberry Growers Association, (30 August 1929).

[160]New Jersey Crop Reporting Service. *Circular No. 400: The Blueberry and Cranberry Industries in New Jersey*. (Trenton: N.J. Department of Agriculture, October 1956), 17, 20, 24-25. Cranberry production was growing steadily in Massachusetts, Wisconsin and the Pacific Northwest during this period, with the Massachusetts industry larger than New Jersey and the other states combined.

[161]New Jersey Crop Reporting Service. *Circular No. 400: The Blueberry and Cranberry Industries in New Jersey*. (Trenton: N.J. Department of Agriculture, October 1956), 8-10.

method at Whitesbog became scooping instead of hand picking.[162] In spite of damage to the vines and lost berries, rising labor costs and increased cranberries acreage made this shift desirable. This work was mainly performed by Italian and Portugese men, with the workforce reduced from 500 to 600 hand pickers to approximately 150 scoopers.[163] Families still came to stay at Whitesbog for the harvest, but children were no longer working on the bogs. According to Paul Eck "by the end of World War II, less than 25 percent of the crop in New Jersey. . .was being picked by hand."[164] By the 1960s the smaller workforce included African-American migrants from the Southern United States, Portugese, and Puerto Rican immigrants living in Rome village as well as some remaining Italian-American workers staying at Florence.

Prior to the 1930s the vast majority of the cranberry crop was sold as fresh berries. Then new techniques for canning and marketing of cranberry sauce created a new, less seasonal market for the fruit. Cranberry Canners Inc. based in Massachusetts was marketing Ocean Spray brand cranberry sauce during the 1930s.[165] Elizabeth Lee of New Egypt, New Jersey was instrumental in experimenting with canning and served as vice-president of Cranberry Canners. By the late 1930s over a million and half cases of cranberry sauce were being packed by Cranberry Canners in South Hanson, Massachusetts. According to Eck, "the new industry offered a profitable outlet for fruit that would not keep well and berries that were too small for the fresh fruit market. More importantly, it changed cranberries from a seasonal fruit to a year-round commodity and offered the growers a marketing outlet for crops during surplus production years. By the beginning of World War II, 25 percent of the cranberry crop was being canned."[166]

This shift in product necessitated a reevaluation of the cooperative marketing procedures established with formation of the American Cranberry Exchange in 1911. Marcus Urann, founder of Cranberry Canners, promoted extending the cooperation of cranberry growers through communal canning contracts and centralized price control. In letters to Elizabeth White he promoted the research efforts of Cranberry Canners, and the importance of cooperation to avoid speculation by commercial canneries. In 1939 Urann sought White's assistance in promoting the continuation of a cooperative approach to cranberry canning:

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[162]Photographs taken by Farm Security Administration photographer Arthur Rothstein in October 1938 do, however, show hand picking at Whitesbog. The FSA photographs are in the Prints and Photographs Reading Room, Library of Congress, Washington, D.C..

[163]Tom Darlington quoted in Bolger et. al., 51.

[164]Eck, 287.

[165]Cranberry Canners was founded 1930 as a cooperative of cranberry growers. The Ocean Spray brand was established in 1925 by United Company, a commercial canner and purchased by Cranberry Canners. See letter from Marcus Urann to Arthur Chaney, (27 March 1939), Whitesbog Preservation Trust collection.

[166]Eck, *The American Cranberry*, 316.

> I understand there is quite a definite feeling among the growers of New Jersey that the sales company should not make a canning contract. This seems to me a decided step backward. ...If in any way you can help influence the cranberry association as an association to continue the canning contract, I sincerely hope you will use your influence which I know is great.[167]

Urann's solicitous communications with White indicate respect for the role she and her father had in establishing and nurturing the Growers' Cranberry Company for the cooperative sale of fresh cranberries. White's replies indicated both her continued interest in progressive cranberry industry development, and her waning influence both within J. J. White Inc. and among other New Jersey growers. She fully supported extending cooperative marketing to canned cranberries, but advised Urann "your estimate of my influence in connection with the canning contract I fear is too high." Tension within the family over management of J. J. White Inc. was evident in White's next comment: "Just before Frank Chambers started for Europe my sisters and their husbands decided that in case of accident to Frank the leadership of Joseph J. White, Inc. would be safer in the hands of my dentist brother-in-law, Dr. Lewis W. Darlington and made him Vice President."[168] Darlington would be casting the vote for the company on the canning issue at the upcoming Growers' Cranberry Company meeting.

Further uncertainty about the future of cooperative cranberry marketing occurred during 1946. Elizabeth White wrote to Chester Chaney of the American Cranberry Exchange urging resolution of a conflict with the competing National Cranberry Association and support of Cranberry Canners. This letter also provides a insight into White's role in J. J. White Inc. during this period. Although she living at Whitesbog and still a director, White claims to have little say in the family business:

> Where does Joseph J. White stand in regard to all this? Truely I know nothing about it. The power in this incorporation is now entirely in Darlington hands. Frank Chambers is still president and of course a director. I am a director. Joseph White Darlington is a director and First Vice President, the other five directors are all Darlingtons.[169]

Joseph White Darlington was J. J.'s grandson, and the eldest son of Beulah and Lewis Darlington. Mary White also married a Darlington, Lewis' brother Emlen. These two couples,

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[167]Letter from Marcus Urann to Elizabeth White, (6 March 1939), Whitesbog Preservation Trust collection.

[168]Letter from Elizabeth White to Marcus Urann, (8 March 1939), Whitesbog Preservation Trust collection. In other letters that same year and in 1943 Urann is asking White for detailed advice on promoting continuation of Cranberry Canners to the growers.

[169]Letter from Elizabeth White to Chester Chaney, (3 December 1946), Whitesbog Preservation Trust collection.

and Beulah's younger son Tom were the five Darlingtons mentioned by White. White guessed that they would continue to support a single cranberry growers association:

> The Darlingtons are a conservative bunch and have been accustomed, in most cases, to doing what Frank Chambers suggested and he is now on the other side of the ocean. They find my words and deeds disturbing to the status quo and are apt to term them unethical in no uncertain terms. They would probably consider this letter unethical because it is written without their knowledge or consent. But they are a thrifty lot and I cannot imagine them voting to pay 7% of the receipts for our cranberries to one cooperative that was doing its best to belittle another cooperative in which the members of Joseph J. White Inc. have an investment of at least $25,000.[170]

In spite of White's terse assessment of her family, other accounts of the direction of cooperative cranberry marketing during the 1940s indicate that the Darlingtons agreed with her. Ed Lipman's memoir of working with Ocean Spray recalls that both Joe Darlington and Elizabeth White were instrumental in his career development by recommending him to represent and promote Cranberry Canners to the New Jersey growers. Lipman was to solicit cranberries for the new Cranberry Canners processing plant in Bordentown, New Jersey.[171]

Eventually many cranberry growers did embrace a cooperative marketing approach for processed berries. As the importance of canned cranberry products grew, Cranberry Canners, later renamed Ocean Spray, became the primary cranberry marketing organization. In 1937 more New Jersey cranberries were sold for processing than for fresh fruit for the first time. By the 1950s an average of 75 to 80 percent of the New Jersey cranberry crop was processed. This trend continued with the growing popularity of cranberry juice cocktail during the 1960s. The unique cooperative structure of Ocean Spray Cranberries today is a descendant of the organizational of efforts of the Whites and other early twentieth century cranberry growers.[172]

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[170]Letter from Elizabeth White to Chester Chaney, (3 December 1946), Whitesbog Preservation Trust collection.

[171]This support was an outgrowth of the friendship between J. J. White and Lipman's father Jacob, Director of the New Jersey Agricultural Experiment Station in New Brunswick. Their cooperation led to creation of a cranberry research laboratory at Whitesbog in 1915. See Edward Voorhees Lipman. *Labor of Love: My Life's Work with Cranberries and Ocean Spray*. (Published by author, 1997), 16-17. Lipman's memoir is a detailed personal account of the development of cranberry agriculture and marketing in New Jersey in the post-World War II period. A 27 August 1943 letter to Marcus Urann from Elizabeth White recommending Lipman for a job is in the Whitesbog Preservation Trust collection.

[172]Eck, *The American Cranberry*, 350-351; New Jersey Crop Reporting Service. *Circular No. 400: The Blueberry and Cranberry Industries in New Jersey*. (Trenton: N.J. Department of Agriculture, October 1956), 25. By the 1990s 85 percent of the cranberry crop was being processed into sauce or juice products. See Eck, 317.

After decades of vigorous work at Whitesbog, Elizabeth White was finally slowed by a stroke in 1945. An elevator was installed from the ground floor utility room at Suningive up through the kitchen to one of the bedrooms. Her relatively new assistant, June Vail, would divide her time between nursing the ailing White and executing her still ambitious plans for the landscape around Suningive. Vail graduated from the Ambler School of Horticulture for Women (now part of Temple University in Philadelphia) in 1942 and worked for Ambler Nursery from 1942 to 1945. She spent nine years working for Elizabeth White, essentially providing the muscle and mobility that White increasingly lacked. When White died in 1954, she referred to Vail in her will as her "daughter-like friend." Vail's memories now provide an important first-hand account of the landscape around Suningive and Elizabeth White's intentions for her garden.

Elizabeth White's legacy was her work with blueberries, hollies, and other plants, her home and garden, and the charitable work she did for the people of the Pine Barrens. Although her role in developing the blueberry is largely forgotten today, her contribution to agriculture and horticulture was widely recognized during her lifetime. She was the first woman member and past president (1929) of the American Cranberry Growers' Association. In 1932 she was the first woman to receive the New Jersey Department of Agriculture's citation for "Outstanding Contributions to Agriculture in New Jersey." In 1934 she was the first woman to be made an honorary member of the Philadelphia Society for Promoting Agriculture, which was founded in 1785. The American Pomological Society awarded her the Wilder Medal in 1952, an honor given for distinguished service and contributions to the advancement of pomological science and for outstanding fruit varieties. By 1954, the blueberry industry she was instrumental in starting over forty years before produced a crop valued at over $3.7 million, in New Jersey alone.[173]

The Darlingtons and Modernization of Whitesbog

In 1948 Joseph Darlington became president of J. J. White Inc. and Isaiah Haines replaced his father as superintendent. Joe, and then his brother Tom, would preside of the next generation of progress and evolution at Whitesbog. Joe Darlington and Isaiah Haines adapted a bulldozer as a cranberry vine planting device. A series of vertical discs mounted on the bulldozer pushed the vines into the soil after they had been scattered over the prepared field. According to Bolger et. al., "the result of this more extensive planting method was to save labor and produce a bog that matured after only three years, compared with the six to ten years required previously."[174]

Joe Darlington's career at Whitesbog ended tragically on October 6, 1948. He was a

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[173]"Elizabeth C. White," Typescript list of honors and awards dated September 1952, Whitesbog Preservation Trust collection; "Elizabeth White, Pioneer Blueberry Grower," *Fruit Varieties and Horticultural Digest* 9:4 (Winter 1954): 50; Frederick A. Perkins, "Ch. 12 Economics and Marketing," in Eck and Childers, eds., *Blueberry Culture*. (New Brunswick, N.J.: Rutgers University Press, 1966), 303. Michigan and Maine produced the second and third largest amount of blueberries.

[174]Bolger et. al., 51-52.

skilled amateur pilot, but died in a small plane crash along with his passenger. His younger brother Tom Darlington had never intended to run Whitesbog. He was a graduate of Swarthmore College and a trained mechanical engineer. Tom Darlington became president of J. J. White Inc. in 1950 and gradually decided to remain at Whitesbog after getting out of the Navy, using his mechanical skills to create what has been called a twentieth-century version of his grandfather's career.[175]

Darlington's most important invention was a dry-harvesting cranberry picker that could replace the manual labor of men with scoops. The first commercial cranberry picking machine was marketed by W. B. Matthewson of Massachusetts in the 1920s. Three to four acres a day could be harvested with this tractor-like device. However, it was a "large, cumbersome machine [that] resembled a huge round revolving comb with curved teeth and was subject to frequent breakdowns."[176] Frank Chambers ordered one of these "Improved Cranberry Picking Machines" for Whitesbog for $2,500 in 1923, contingent on testing the claim that it would not harm the vines any more than scooping and harvest 90 percent of the marketable berries.[177] Probably because of the expense and breakdowns, machine harvesting did not replace hand picking and scooping at Whitesbog until decades later with Darlington's invention.

Like the Matthewson device, the Darlington picker operated on the principle of mechanically stripping the berries from the vines. Darlington patented two versions of his smaller, more lightweight mechanical picker, one in 1954 and another in 1957 (the patents had been filed in 1951 and 1953).[178] Darlington's first patent described the purpose of his invention as "to obtain a greater yield by mechanical picking of cranberries, avoiding to a greater extent the tendency of prior pickers to crush the berries, leave them on the vine or cause them to drop on the ground." The later version was better adapted for use in heavy vines. The Darlington picker resembled an oversized lawnmower with a series of curved picking combs spaced around a cam in front and a hopper for collecting the berries in the back. As the cam rotated the picking combs moved down and rearwards. A roller at the bottom of the picking wall held the vines while the combs swept through, stripping off the berries and lifting them toward a vertical conveyor behind the cam along the picking wall. The conveyor delivered the berries into the hopper behind the picking wall. One person walked behind and guided the picker.

Like scooping, successful use of mechanical pickers necessitated pruning the cranberry

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[175]Bolger et. al., 52.

[176]Eck, *The American Cranberry*, 293.

[177]Letter from F. S. Chambers to John F. Kemp & Company, (22 November 1923), Whitesbog Preservation Trust collection.

[178]U.S. Patent No. 2,664,692, "Picker for Cranberries and the Like," (5 January 1954); U.S. Patent No. 2,780,905, "Picker for Berries and the Like," (12 February 1957).

vines to keep them from being too long and tangled but the labor needed for harvest was greatly reduced. Fifteen men with machines could now do the work of 150 scoopers. The Darlington picker did have limitations including a 20 to 30 percent field loss due to unharvested berries, a tendency to bruise the berries, reducing their shelf life, and a relatively low harvesting capacity of one-acre per day because of its two-foot width. However a wider width was less efficient and decreased maneuverability. Overall the Darlington picker was a major improvement over earlier methods and became popular among New Jersey cranberry growers.[179]

The boom in the cranberry juice market and the lack of labor for picking also inspired the prevalence of water harvesting by the 1950s. Water harvesting involved flooding the bogs and raking the berries off the vines so they floated to the surface for gathering. This method was developed in Wisconsin where growers were water harvesting more than half their acreage by the 1940s. This technique allowed cranberries to be harvested quickly, and reduced vine damage and loss due to dropped berries and incomplete picking. However water harvesting caused a serious reduction of shelf-life for the cranberries. Fresh cranberries required dry harvesting to encourage preservation. If kept dry and cool cranberries have a long natural shelf life, but if picked wet they had a tendency to rot quickly. However if the cranberries were taken directly for canning, less expensive water harvesting methods were suitable. The growing market for processed cranberries in the post-World War II period encouraged adoption of water harvesting by East Coast growers. Initially variations on dry pickers were used to pull the berries off the vines in the flooded bogs. In the early 1960s a water reel or beater that knocked the berries off the vines became popular.[180]

Water harvesting came to New Jersey in 1965, introduced by Bill Haines of Hog Wallow. This harvest technique is still prevalent today. Using a water reel to knock the berries free, the floating fruit is then corralled on the downwind side of bog and loaded into a truck using a conveyor lowered into the water. Only a few workers are now needed to harvest an entire crop of cranberries. However, a problem facing many Eastern growers was the large size and uneven level of their older bogs. A great deal more water was required to flood a bog out of level than a small, perfectly level one. Subsequently many growers began rebuilding and changing their bogs. Tom Darlington also realized that new bogs specifically designed for water harvesting would better utilize its advantages, since some of his older bogs were as much as five feet out of level. He built a series of new bogs in an area called Buffins Meadows just south Whitesbog Village along Pole Bridge Branch and adjacent to the historic bogs. Completed in 1967, the Buffins Meadows bogs are level, and regular in shape with parallel dikes dividing the area into 200-foot wide bogs. A sprinkler system was included to guard against frost damage, allowing the water to be safely drawn off the bogs earlier in the spring. With these changes larger crops

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[179]Bolger et. al., 52; Eck, *The American Cranberry*, 294. Photographs of the Darlington picker in use are in the Whitesbog Preservation Trust collection.

[180]Eck, *The American Cranberry*, 298-299.

are produced, allowing Darlington's 150-acres of new bogs to exceed the production of his grandfather's 600-acres with just a handful of workers.[181]

Tom Darlington's mechanical approach to agriculture also extended to the blueberry fields. He invented a blueberry picking machine - a tall, two-track vehicle that straddled a row of bushes and shook off the berries into receiving plates. In 1982 Darlington described the importance of invention and innovation in the cranberry industry and his own career:

> [The inventive spirit] is a requirement in cranberry farming. Farmers who raise normal crops, like corn or wheat or potatoes, have enough other people doing the same thing so that there are a lot of big companies whose business it is to develop that sort of thing. Cranberries is a small enough industry, and specialized enough, so that regular agricultural equipment will not work on cranberries. I would not be here if it were not for my mechanical engineering background. That's the part of it I enjoy. I am no green thumb, particularly.[182]

Modern changes to wet harvesting and the importance of processed cranberry products removed the historic need for worker housing and fresh cranberry packing facilities at Whitesbog. In 1967 Darlington decided to sell the old Whitesbog property including the old bogs and the villages of Whitesbog, Rome, and Florence to the state of New Jersey. The land was acquired by the Department of Environmental Protection and added to Lebanon State Forest using the New Jersey Green Acres Land Acquisition Act of 1961. The Lebanon State Forest would now reach from the Four Mile Colony at the edge of New Lisbon, founded with Elizabeth White's help, to the borders of the Fort Dix Military Base at the northern edge of the Whitesbog property. Darlington then leased some of the old bogs from the state to increase production and benefit from the growing demand for cranberry juice. This arrangement between J. J. White Inc. and the state continues to the present, now with Tom's sons Mark and Joe Darlington running the company. J. J. White Inc. also leased a number of blueberry fields at Whitesbog until 1990.[183]

As Whitesbog moved from private to public hands, a number of government and non-profit groups have played an important role in the stewardship of this landscape in the past thirty-five years. In 1968 Dr. Eugene Vivian of Glassboro State College (now Rowan University) started an environmental education program called CESC - the Conservation and Environmental Studies Center. That program was disbanded in 1984, but in 1985 a new environmental studies program named P.I.N.E.S. (Pinelands Institute for Natural and Environmental Studies) was founded by Glassboro State professor Gary Patterson. The P.I.N.E.S. program is currently

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[181]Eck, *The American Cranberry*, 299, 302; Bolger et. al., 53-54.

[182]Quoted in Bolger et. al., 52-53.

[183]See http://www.whitesbog.org.

housed in the General Store and provides hands-on science programs for school groups about the Pine Barrens ecosystem and other topics.

After initial attention to the importance of the natural landscape at Whitesbog, the cultural landscape of historic buildings and agricultural came to be appreciated as well. In the mid-1970s a private, non-profit environmental group, the New Jersey Conservation Foundation, opened a field office at Suningive. It was NJCF that sponsored the original research and documentation effort in 1982 that allowed Whitesbog to be designated a National Register Historic District in 1988. Interest in Whitesbog's history was also demonstrated by formation of the Whitesbog Preservation Trust in 1984. The organization hosted its first mid-summer Blueberry Festival and fall Cranberry Festival that year. These popular annual events continue to raise awareness of the unique resources and history of Whitesbog. Granted non-profit status in 1986, WPT has worked to preserve and restore the buildings and landscape at Whitesbog through a lease agreement with Lebanon State Forest.

Since 1978 the entire area has been a small piece of the million-acre Pinelands National Reserve created by Congress to protect the fragile and unique ecosystem of the New Jersey Pine Barrens. Development is restricted and overseen by a fifteen-member Pinelands Commission. Traditional uses of the landscape such as cranberry and blueberry agriculture were allowed to continue. J. J. White Inc., now run by Tom Darlington's sons Mark and Joe, still grows cranberries in modernized bogs on Whitesbog property. The blueberry industry started by Elizabeth White appears throughout southern New Jersey and other regions suited to blueberry growing. In a period when women had limited opportunities for professional accomplishment, Elizabeth White built her own career from her passion for the plants of the New Jersey pines. In her words:

> Oh! The Jersey Pines! They certainly do take a strong hold on us who are attuned to their peculiar charm. Visits to the beauty spots of other lands, Italy, Greece, Switzerland have only served to intensify my love and appreciation of the special beauties of my native pine country.[184]

At Whitesbog the work of Elizabeth White, and the Fenwick, White, and Darlington families created an unique landscape engineered for agriculture in the midst of the "special beauties" of the Jersey Pines.

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[184]Elizabeth C. White. "The Pineys of New Jersey." read before the Nassau Chapter of the Daughters of the American Revolution, Camden, N.J. (13 January 1917), 3, typescript in Whitesbog Preservation Trust collection.

ADDENDUM TO:
WHITESBOG VILLAGE & CRANBERRY BOG
Whitesbog Road
Pemberton Township
Burlington County
New Jersey

HALS NJ-1
NJ-1

REDUCED COPIES OF MEASURED DRAWINGS

FIELD RECORDS

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